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TECHNICAL REPORT ECOM-1346F

# TROPICAL SERVICE LIFE OF ELECTRONIC PARTS AND MATERIALS

FINAL REPORT


*By*

*B. H. DENNISON - W. B. MORROW*


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1 JUNE 1965 TO 31 MAY 1966

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UNITED STATES ARMY ELECTRONICS COMMAND · FORT MONMOUTH, N.J.


CONTRACT DA 28-043-AMC-01346(E)
(CONTINUATION OF CONTRACT DA 36-039-AMC-02241(E))



MELPAR, INC.
Falls Church, Virginia

# TROPICAL SERVICE LIFE OF

# ELECTRONIC PARTS AND MATERIALS

FINAL REPORT

by

B. H. Dennison - W. B. Morrow

Contract Nr. DA 28-043-AMC-01346 (E)
Department of the Army
Task Nr. 1P6-22001-A-057
Continuation of
Contract Nr. DA 36-039-AMC-02241 (E)
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U.S. Army Electronics Command
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## Purpose

The purpose of this effort is to evaluate the degree and extent of degradation of selected electronic components in tropical environments over an extended period of time. The components are the type commonly employed in the fabrication of equipment designed for tactical use by the armed services. The component complement consists of units with industry and service acceptance of over a dozen years as well as recent additions resulting from the pressure and trend toward microminiaturization.

This program will establish: (1) the failure rate of the selected electronic components when subjected to tropical environments over an extended period of time; (2) the mode of failure and/or degradation where applicable; (3) a laboratory stress test that has proven results that correlate with the field results to provide acceleration factors for the future evaluation of similar type components.

The results of the field tests will provide direct indications of the tropical environmental resistance of the selected components. From the field test data, extractable information will be available to aid future effort in the improvement of various classes of components to withstand tropical environments. The laboratory tests will provide the basis for a specific laboratory simulation method of proven correlation for use in the evaluation of other component types without extensive field testing.

## Abstract

During the contract year a degree of correlation between the field and laboratory stress environments, as reflected through changes in component characteristics was accomplished. Since the correlation studies are as yet incomplete, detailed information will be provided in future reports. The specified MIL-STD-202C Method 106B 20-cycle temperature and humidity stress environment was found to yield correlation with certain jungle-exposed components. From the 6-18-64 Phase I groups, these were composition resistors, carbon-film resistors, wire-wound resistors, Mylar capacitors, and mica capacitors. From the 9-21-65 Phase II component groups, correlation was observed for the cermet variable resistor on a failure only basis. The variable ceramic capacitor has exhibited failure in the field environment, but not in the laboratory environment. None of the remaining exhibited a failure mechanism and field data are considered premature at present for a correlation analysis based upon degradation.

One very significant indication of both field and laboratory stressing is that correlation will be based primarily upon degradation rather than failure. The specified laboratory test does not in any way provide the stress and corrosion effects of the airborne salt and dust present at the tropical seashore exposure site. It is the conduction of this surface that has yielded data which do not faithfully represent the performance of certain high impedance components.

During this year, a revision in technique was instituted to remove by washing the salt deposited on the Teflon component boards. This has resulted in the seashore data having less divergence than before and actually approaching the jungle data. This washing process does not inhibit or eliminate corrosion of the component terminal leads or the effect of shunting over the component surface by the deposited conductive salt film. It is corrosion of leads which has caused the majority of catastrophic failures: e.g., the microminiature modules and ceramic capacitors. Corrosion was observed to render wrapped solder connections unstable, requiring resoldering and replacement of lead wires.

The Phase I components after 22 months of exposure were removed from their specified environments and allowed to dry out or recover in the test site laboratory with sample readings taken at progressive intervals. The high impedance components, (e.g. CK and RN) were observed to exhibit value changes within 1 hour due to evaporation of surface moisture. The low impedance components (e.g., RC and CM) exhibited value changes over the drying period due to the reduction of absorbed moisture. The drying process was accelerated by the use of dessicant material and a hot room. After 2 weeks, the components were measured and returned to their specified stress environments.

The Phase II components, on exposure for 8 months, were observed to perform well except for the energized variable ceramic capacitors (VC) which are beginning to develop symptoms of silver migration. The series resistance was measured as low as 21,000 ohms for one unit. These components will now

be scanned for units having series resistance of less than 1.0 megohm as a monitor of the progress of this degradation. The RJ variable resistor was recorded with a reduced erratic resistance value owing to moisture absorption.

The Phase II components exposed to the specified 20-cycle MIL-STD-202C stress test did not give any indication of the type of degradation observed in the field for the energized VC components. Erratic degradation of the variable resistors (RJ) corresponding to field data was observed. The remaining components exhibited no failure and only minor degradation in the laboratory test.

The personnel at the Tropic Test Center were instructed on the use of the Q Meter as may be required for future evaluation of small value inductance and capacitance components.

For this and future reports, the data format and processing have been revised to provide more complete evaluation and correlation.

## 1. PUBLICATIONS, LECTURES, REPORTS, AND CONFERENCES

During this contract, several conferences and symposia were attended by Melpar personnel and representatives of various Government agencies for planning and information purposes in order that the objectives of the program might be successfully accomplished. Table 1 is a chronological summary of these meetings.

TABLE 1

SUMMARY OF MEETINGS

| Date | Place | Melpar Representatives | Government Agency | Government Representatives |
|---|---|---|---|---|
| June 1965 | Melpar, Inc., Falls Church, Va. | Alfred A. Fini<br>W. B. Morrow, Jr. | USAECOM | E. Linde |
| 18 Sept. to 1 October, 1965 | Panama, Canal Zone | Alfred A. Fini<br>W. B. Morrow, Jr.<br>C. G. Moxley | USAECOM<br>U.S. Army Tropic Test Center | C. P. La<br>Col. P.R<br>Juan M. |
| 26-30 Nov. 1965 | New Orleans, Louisiana | Alfred A. Fini | | C. P. La |
| 1-3 Sept. 1965 | Atlantic City, N.J. | W. B. Morrow, Jr. | USAECOM | E. Godwi |
| 16 Dec. 1965 | Ft Monmouth, New Jersey | Alfred A. Fini | USAECOM | C. P. La<br>E. Linde |
| 3 Jan. 1966 | Ft Monmouth, New Jersey | L. Eliason<br>W. B. Morrow, Jr.<br>R. S. Stowe | USAECOM | C. P. La<br>E. Linde |
| 20 Jan. 1966 | Ft Monmouth, New Jersey | L. Eliason<br>B. H. Dennison | USAECOM | C. P. La<br>E. Linde |
| 17 Jan. 1966 | Melpar, Inc., Falls Church, Va. | B. H. Dennison<br>W. B. Morrow, Jr.<br>J. L. Pentecost | USAECOM | J. Sperg |
| 15 March 1966 | Ft Monmouth New Jersey | B. H. Dennison<br>W. B. Morrow, Jr. | USAECOM | C. P. La<br>E. Linde |
| 4 May to 18 May 1966 | Panama, Canal Zone | B. H. Dennison<br>C. G. Moxley | USAECOM<br>U.S. Tropic Test Center | E. Linde<br>F. T. Br<br>Col. P.R. |

TABLE 1

SUMMARY OF MEETINGS

| | Melpar Representatives | Government Agency | Government Representatives | Purpose |
|---|---|---|---|---|
| ., h, | Alfred A. Fini<br>W. B. Morrow, Jr. | USAECOM | E. Linden | Technical discussion |
| | Alfred A. Fini<br>W. B. Morrow, Jr.<br>C. G. Moxley | USAECOM<br>U.S. Army Tropic Test Center | C. P. Lascaro<br>Col. P.R. Flor Cruz<br>Juan M. Calderon | Equipment installation, field inspection, personnel briefing |
| , | Alfred A. Fini | | C. P. Lascaro | Nat. Soc. of Corrosion Eng. Symposium |
| | W. B. Morrow, Jr. | USAECOM | E. Godwin | Symposium on Communications Wire & Cable |
| , | Alfred A. Fini | USAECOM | C. P. Lascaro<br>E. Linden | Discussions on contract technical progress |
| , | L. Eliason<br>W. B. Morrow, Jr.<br>R. S. Stowe | USAECOM | C. P. Lascaro<br>E. Linden | Contract discussion |
| , | L. Eliason<br>B. H. Dennison | USAECOM | C. P. Lascaro<br>E. Linden | Technical discussion |
| ., h, | B. H. Dennison<br>W. B. Morrow, Jr.<br>J. L. Pentecost | USAECOM | J. Spergel | Technical discussion |
| | B. H. Dennison<br>W. B. Morrow, Jr. | USAECOM | C. P. Lascaro<br>E. Linden | Discussion on approval of quarterly report |
| | B. H. Dennison<br>C. G. Moxley | USAECOM<br>U.S. Tropic Test Center | E. Linden<br>F. T. Brannan<br>Col. P.R. Flor Cruz | Evaluation of component degradation & failure |

## 2. FACTUAL DATA

### 2.1 Contract Guidelines

The following three pages are the technical guidelines for this contract.

TECHNICAL GUIDELINES 1 May 1963
42300 23 September 1963

TROPICAL SERVICE LIFE OF ELECTRONIC PARTS AND MATERIALS

1. Scope

1.1 These guidelines cover investigations leading to the establishment of accurate data as a basis for predicting the reliable operating service life, in tropical environments, of electronic parts and materials used in current types of military electronic communications and surveillance devices.

2. Applicable Documents

2.1 Military Standard 202C, "Test Methods for Electronic and Electrical Component Parts," Method 106B, "Moisture Resistance."

3. General

3.1 Effort covered by these technical guidelines is considered to be Phase II of a program of investigation to determine the ability of current types of miniaturized electronic parts and materials to perform satisfactorily in natural tropical environments and to determine the usefulness of Method 106B of Military Standard 202C as an instrument for predicting the tropical service life of such parts and materials.

3.2 Phase I of the above-referenced program of investigation, initiated under Contract No. DA-36-039-AMC-02241 (E) included the following:

3.2.1 Sets of selected test items, suitably mounted and wired on exposure panels, delivered to tropical test sites. Testing initiated by personnel in accordance with contractor's instructions.

3.2.2 Other sets of selected test items, identical in kind and function to those referenced in 3.2.1, tested in the contractor's laboratory

in accordance with Method 106B of Military Standard 202C. These tests, initiated early in Phase I, will serve as pilot runs for any necessary minor modification of jigs, wiring, orientation, instrumentation, etc.,of items delivered to tropical test sites.

3.2.3 At least one set of selected test items, identical in kind and function to those referenced in 3.2.1 and 3.2.2, tested and maintained as a control set.

4. Requirements

These technical guidelines cover the effort to be included in Phase II as follows:

4.1 Simulated Exposure Tests

Sets of selected parts and materials will be tested in the contractor's laboratory, in accordance with the provisions of Method 106B of Military Standard 202C and selective variations of it until a statistical correlation with tropical field failure occurs or until a two-year equivalent field exposure time is completed. Appropriate electrical performance tests will be made at predetermined intervals and visual observations of fungus growth, discolorations, corrosion, cracks, etc., will be made as a part of the data recording procedure.

4.2 Natural Tropical Exposure Tests

Sets of selected parts and materials, properly mounted and wired, on suitably placed and oriented exposure racks which were delivered to the test site(s) during Phase I will be subjected to appropriate electrical tests at predetermined intervals. Measurements will be made by test personnel in accordance with instructions furnished by the contractor. Visual

observations of fungus growth, discoloration, corrosion, cracks, etc., will be made as a part of the data recording procedure. All field failures will be analyzed for identification of failure mechanisms and correlation with laboratory test failure types.

4.3 Correlation of Test Data

Test data obtained at the natural Tropical Test Site(s) will be forwarded to the contractor's laboratory as expeditiously as possible in order that a statistical analysis of the results and comparison of the data with data obtained from laboratory exposure may be made and a technical evaluation made as to the tropical service life reliability of parts and materials and the efficiency of the laboratory test procedures in reproducing field use conditions.

4.4 Selection of Additional Parts

A further selection of newer families of microminiaturized parts and associated materials shall be made and parts obtained and processed for exposure to field and laboratory test conditions.

4.5 Outdoor tropical exposure tests shall be conducted for a minimum period of 1.5 years for 60% confidence level. Acceleration factors and failure rates shall be established and are defined as follows:

$$\text{Acceleration Factor} = \frac{\text{Failure Rate in Accelerated Laboratory Test}}{\text{Failure Rate Under Field Conditions}}$$

Failure Rate = Number of Failures per Unit Time

The requirements of these stated technical guidelines have been complied with as follows:

Natural Tropical Exposure Tests

The first selection of electronic components was put on exposure at the jungle and sea shore sites with initial data recorded on 6/18/64. The elapsed exposure time with recorded data is $22\frac{1}{2}$ months followed by a 2-week recovery cycle in a low relative humidity atmosphere. The minimum requirement of $1\frac{1}{2}$ years of exposure has been met for these component groups.

The second selection of electronic components was put on exposure at the jungle and sea shore sites on 9/21/65. Seven months of data are currently available.

Simulated Exposure Tests

Sample lots of all the selected electronic components were exposed to the environment specified by Method 106B of Military Standard 202C for 20 cycles.

Correlation of Test Data

Correlation of test data has been attempted for the jungle and the simulated exposures only. This correlation has been attempted for the components put on exposure on 6/18/64 in the jungle environment. The sea shore exposure data have been found to reflect the effect of shunting due to a salt-water film on the terminal boards. At this time, correlation for the 9/21/65 exposed components is considered premature.

Acceleration factors can be estimated for those components which have failure data from both exposure tests.

## 2.2 Accelerated Stress Testing

In accordance with the requirements of the contractural guidelines, sets of selected electronic components from both the Phase I and Phase II component groups have been subjected to the specified 20-cycle laboratory test during the period of this contract. The laboratory environmental test chamber, test equipment, installation of selected components, and the test program were fully described in paragraphs 4.1 and 4.2 of the Second Quarterly Report, Reference 10.

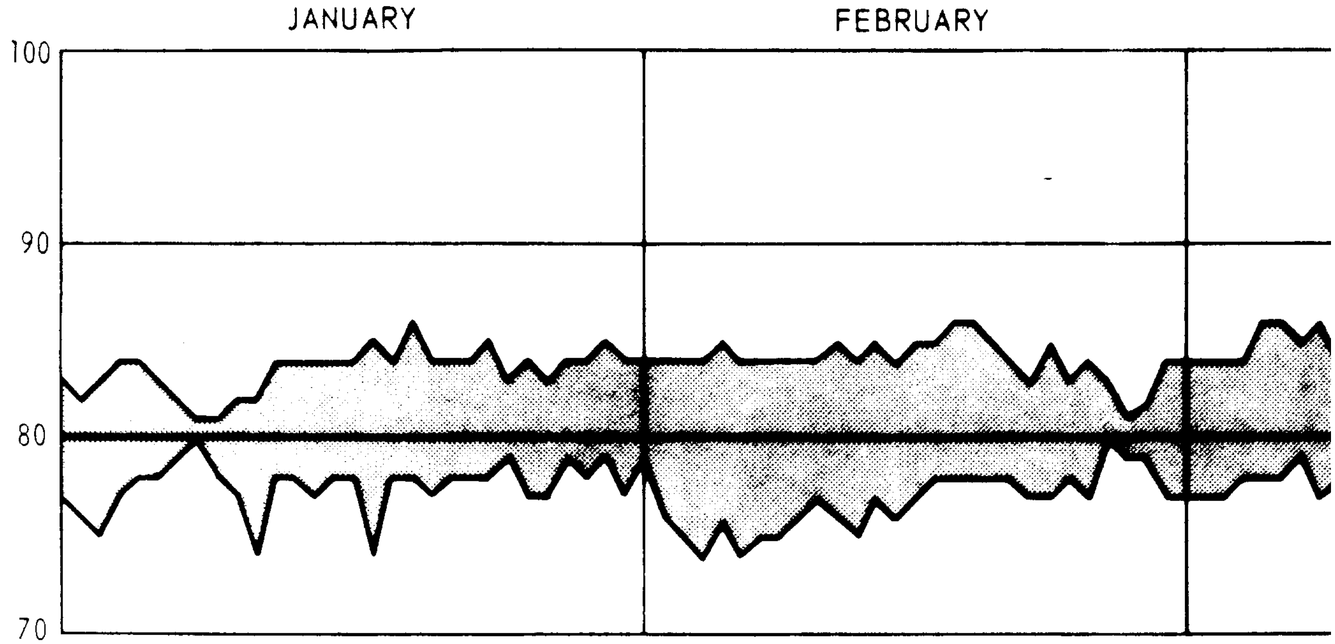
The test results and correlation curves are given in paragraphs 4.2.1 through 4.2.8 of reference 10 for the 18 June 1964 (Phase I) components. Since defined failures were recorded for but two out of the eight components, the definition for the acceleration factor must be modified to reflect degradation rate or degree of degradation rather than the specified ratio of failure rates if such a factor is to be stated with factual basis. Correspondingly, the results of the accelerated stress tests for the samples selected from the 21 September 1965 (Phase II) components report (paragraphs 2.16 through 2.25 of this report) resulted in only one catastrophic failure and no extensive degradation. For one component, the type RL207 tin oxide resistors, the degradation is less than the limits allowed for instrument error. Based upon the results obtained, the test does not appear to stress the Phase II components sufficiently to be considered as an acceleration test. The one component that exhibited a failure mechanism in the laboratory test has exhibited the same failure in the field, and conversely, one component which has exhibited a failure mechanism in the field did not develop the same mechanism during the laboratory test.

The specified laboratory test has merit based upon usage over many years of testing of components. Based upon the results obtained from the exposure of the components selected for evaluation in this program observed correlation is between 35 and 50 percent. A truly universal test may never be possible, but future efforts of this program will be to attempt to evaluate other tests which might be used to supplement MIL-STD-202C, Method 106B in order to provide the effectiveness of a universal test. The first test now planned will be a fixed-temperature, high-humidity exposure with low percentage salt fog. This is a variation on a standard test which will introduce the additional stress of corrosion and associated contamination.

## 2.3 Field Environment

The environment present at the field test sites on the Caribbean side of the Canal Zone is relatively uniform in nature and does not exhibit drastic changes caused by "fronts" with their associated temperature, relative humidity, and barometric pressure changes. The winds aloft are such that radio sondes going to altitudes of over 100,000 feet return to within 5 miles of the launch point.

To further illustrate, refer to figures 1, 2, and 3 which are daily and weekly composites of 3 years of weather data taken at the jungle site by the Naval Research Laboratory. A best estimate for an average daily temperature range is $75^{\circ}$ to $90^{\circ}F$ and the average daily relative humidity range is 75 to 90 percent. The rainfall data are presented. The components are protected from direct rainfall by a shelter and cabinet. It is noted that airborne salt increases during periods of low rainfall. The


JANUARY
FEBRUARY
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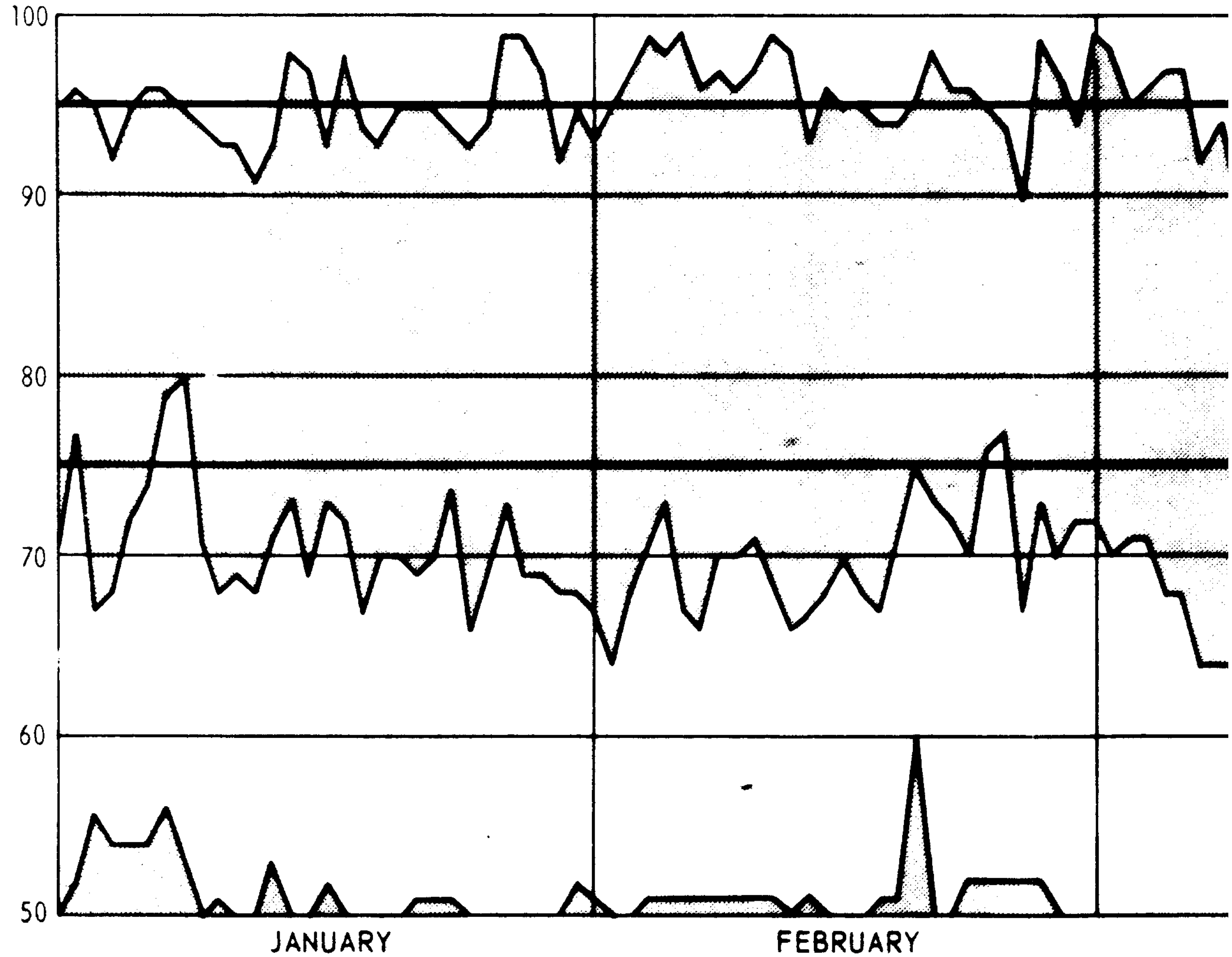
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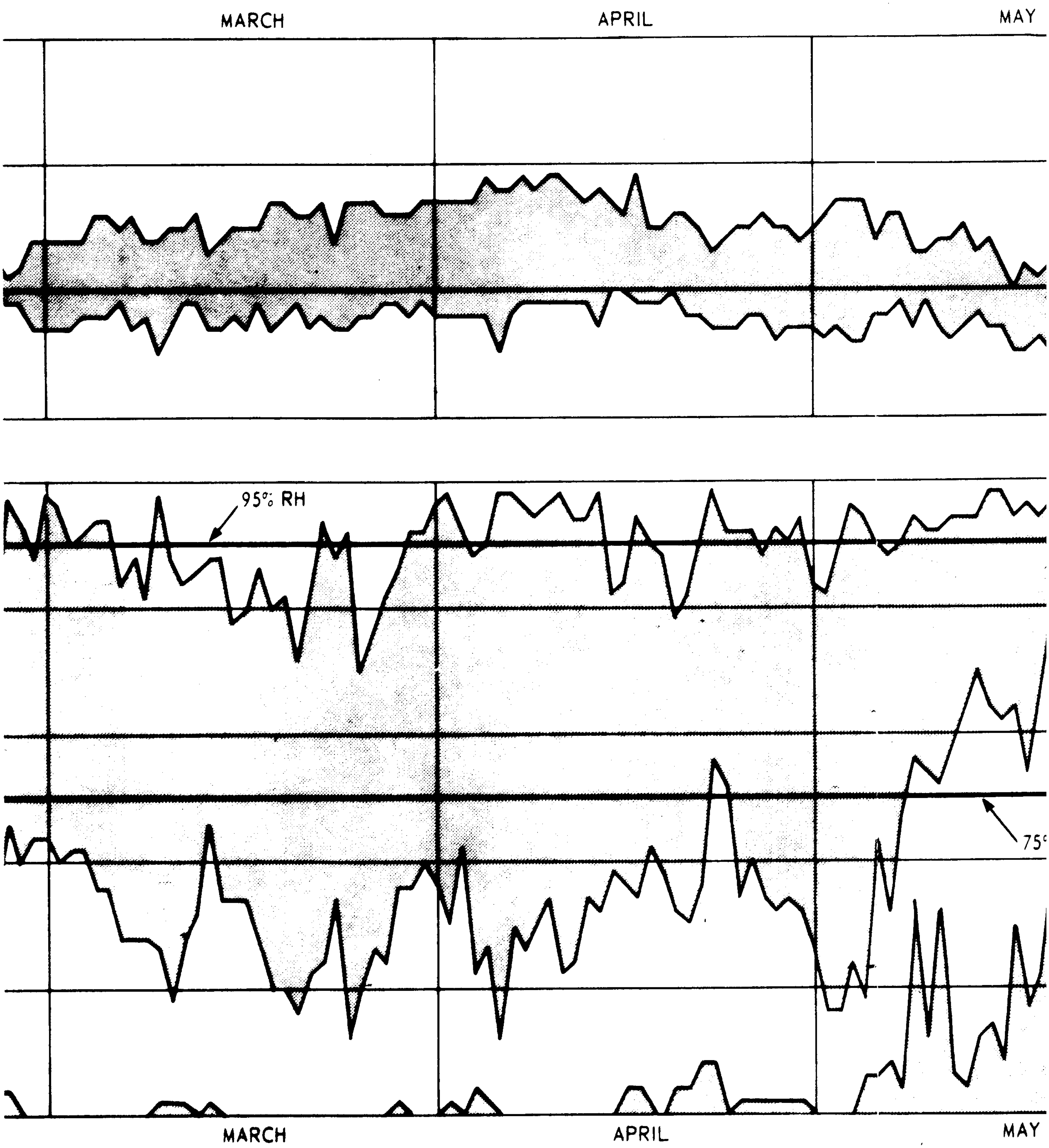
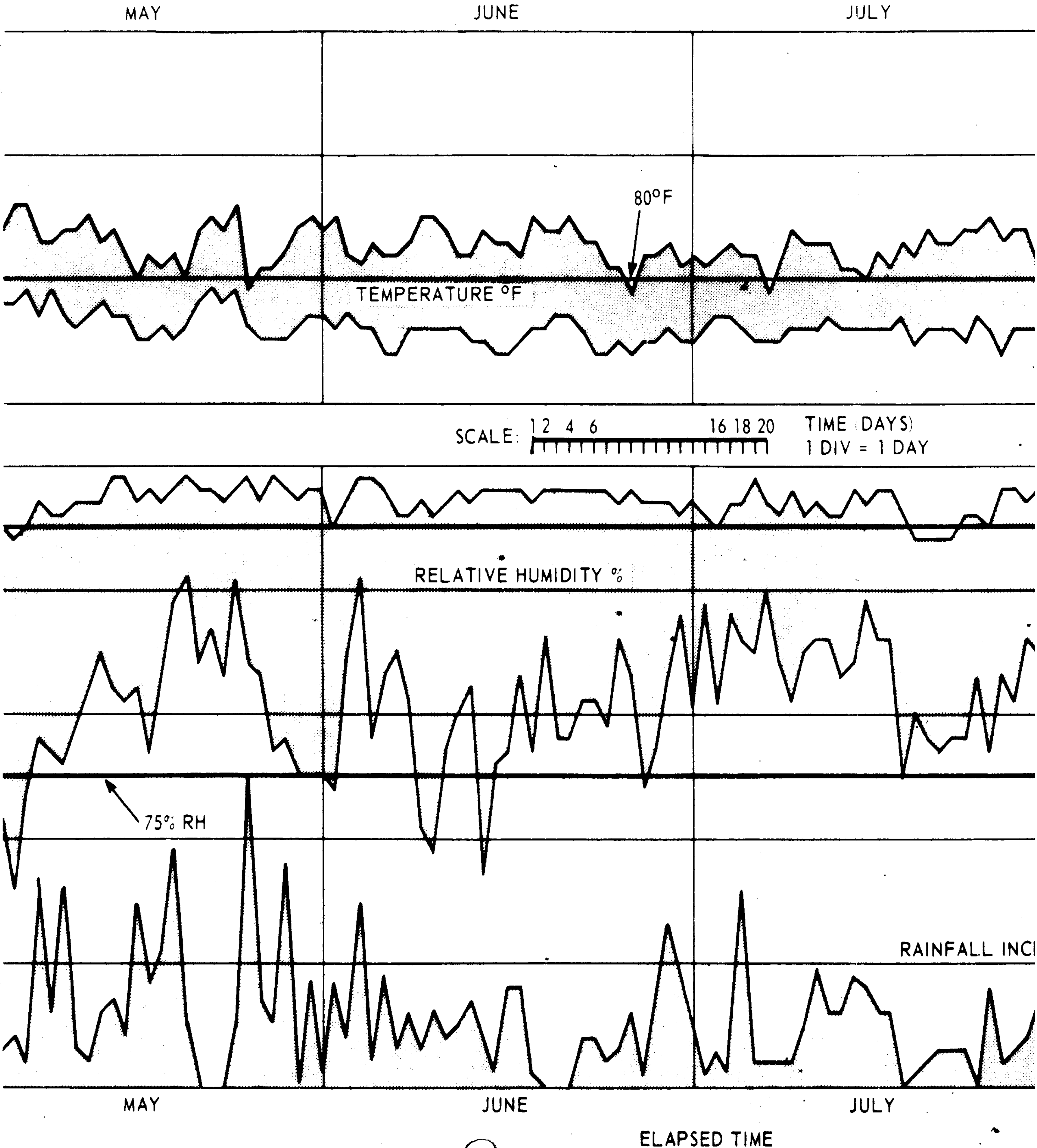
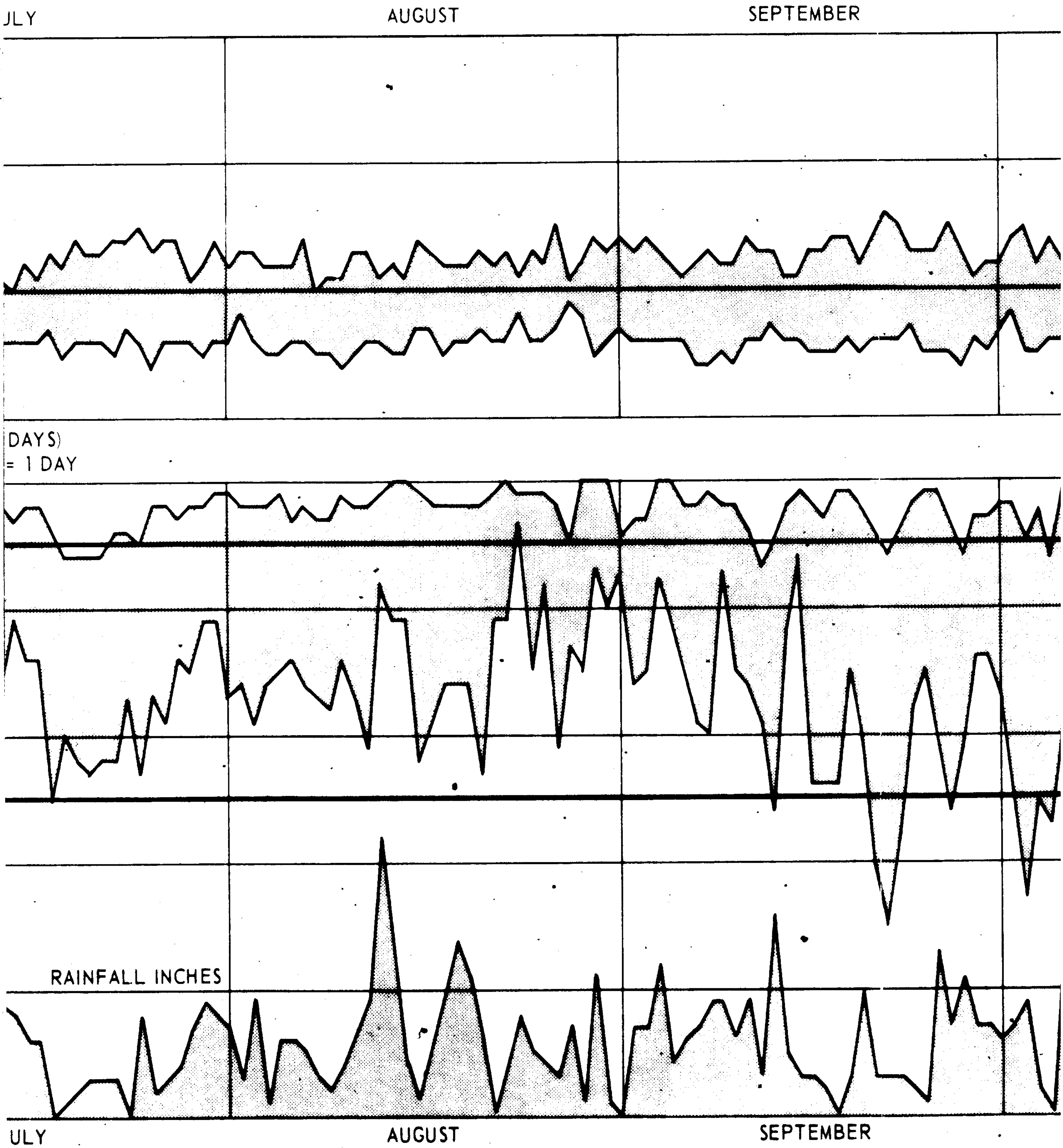

MARCH
APRIL
MAY
95% RH
75°
MARCH
APRIL
MAY



MAY
JUNE
JULY
80°F
TEMPERATURE °F
SCALE: 1 2 4 6 16 18 20
TIME (DAYS)
1 DIV = 1 DAY
RELATIVE HUMIDITY %
75% RH
RAINFALL INC
MAY
JUNE
JULY
ELAPSED TIME


JLY
AUGUST
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DAYS)
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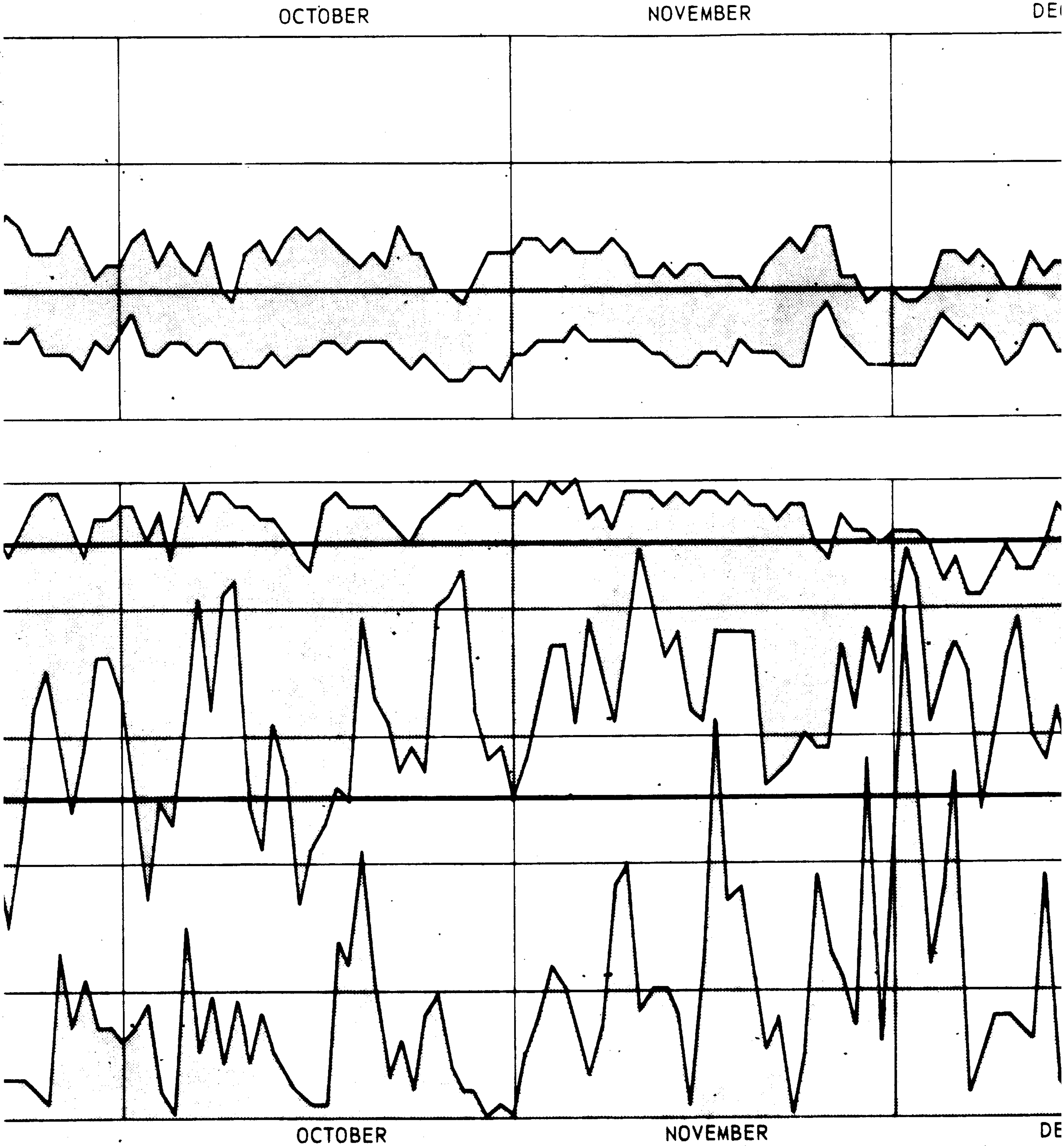
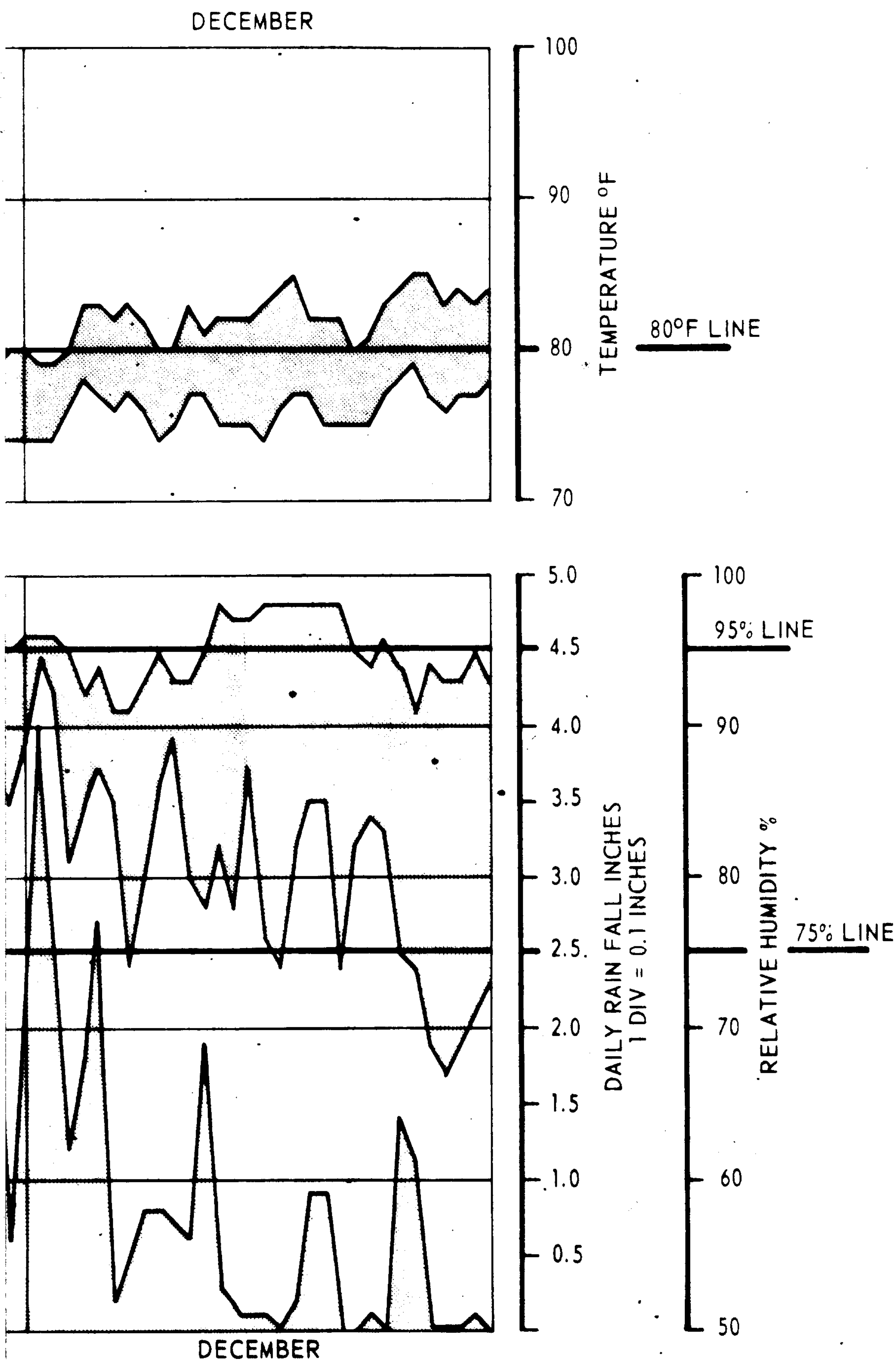



Figure 1. Plots of Maximu
and Minimum R




Plots of Maximum and Minimum Daily Temperature (%), Maximum and Minimum Relative Humidity (%), Total Daily Rainfall (Inches)

(6)

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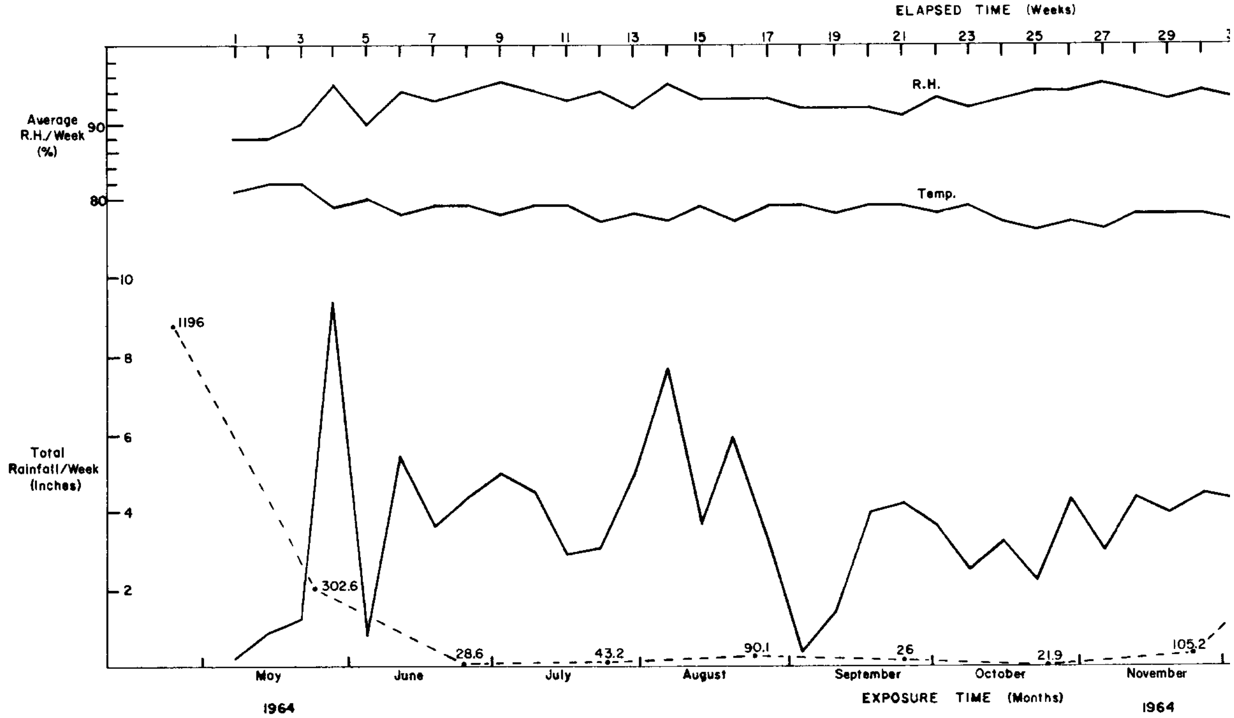


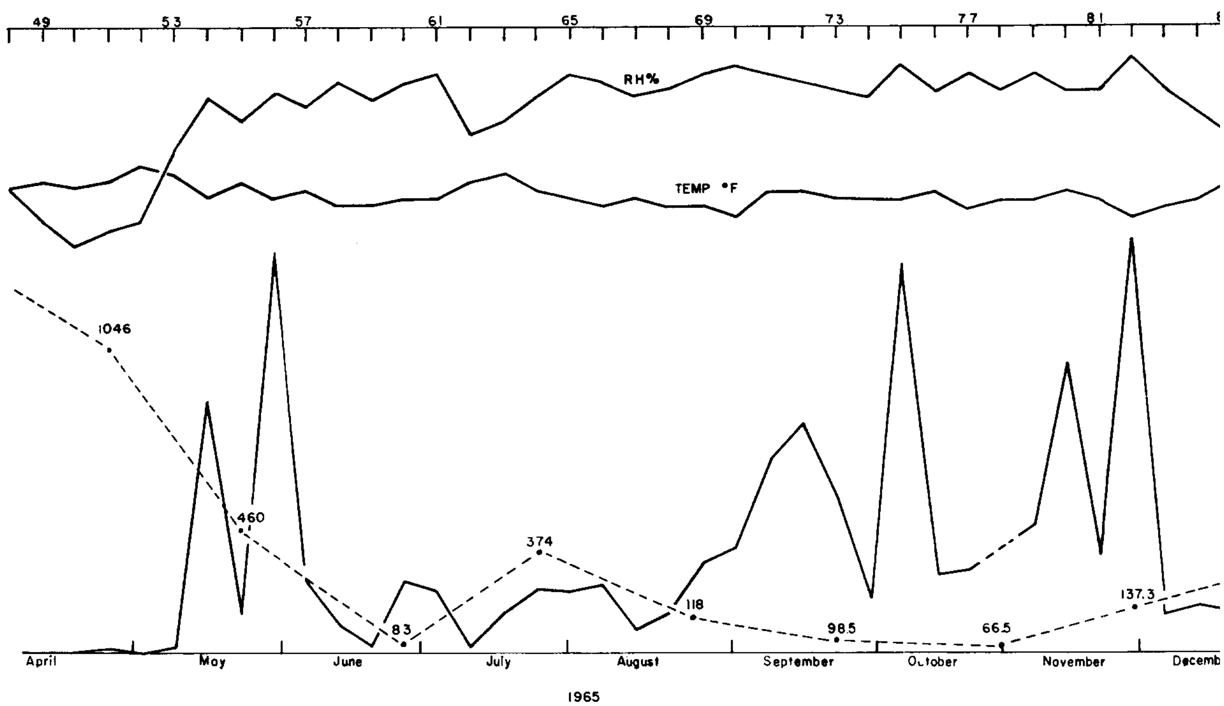
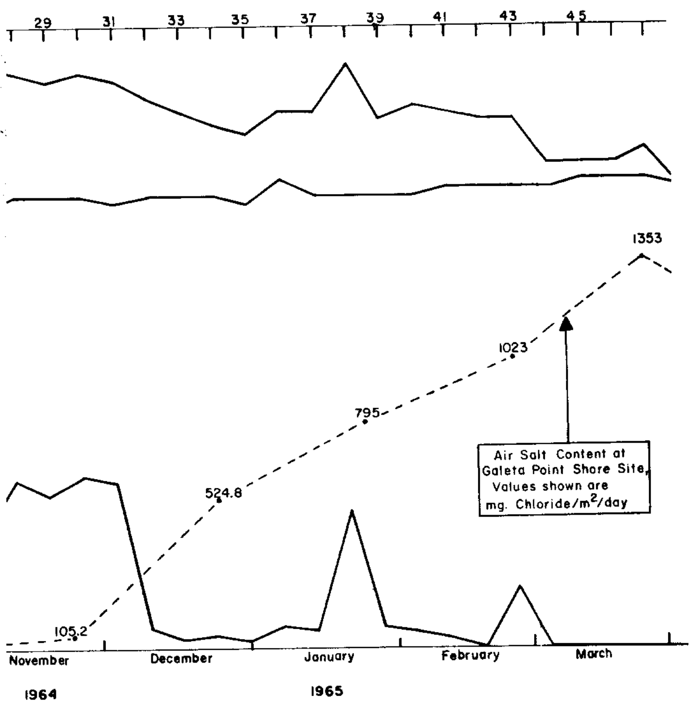
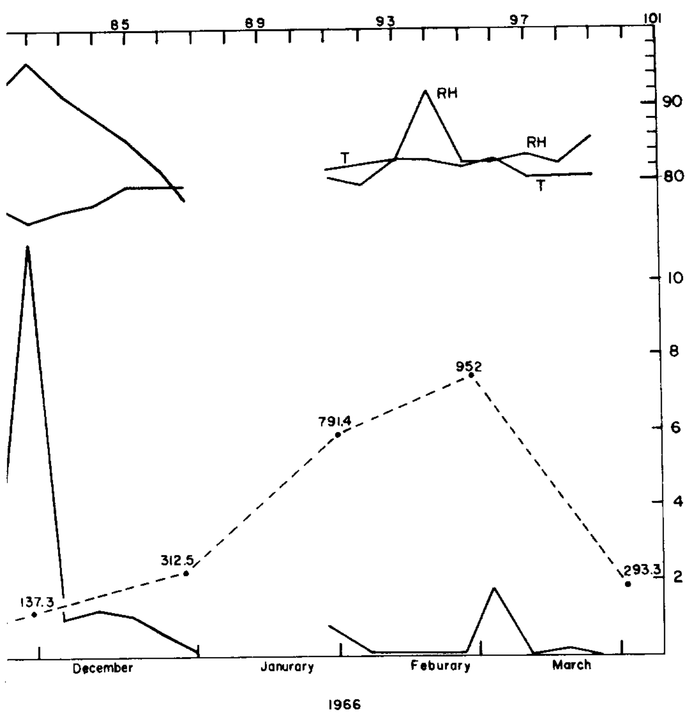




Figure 2. Jungle Environ




: Environmental Data



2

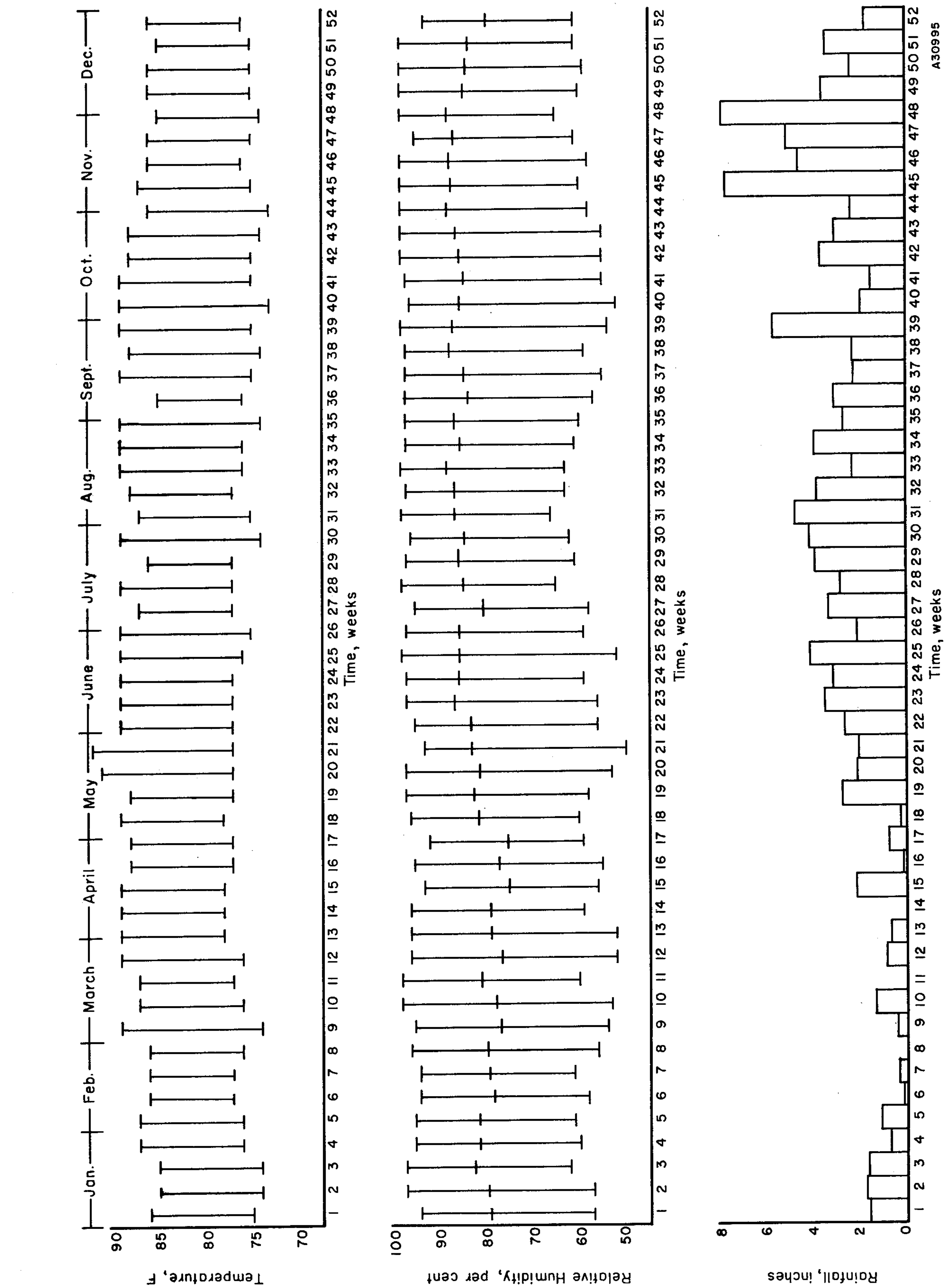



Figure 3. Average Maximum and Minimum Temperature; Average Maximum, Minimum, and Bihourly Mean Relative Humidity; and Average Rainfall at Tropical Exposure Site From June 1955, to September 1958

temperature stress here is only a few degrees above normal room ambient with increased humidity. As to other environmental components which could change or vary to generate stress, barometric pressure is very steady as illustrated by the graph in figure 4 taken near the site at an elevation of 1 meter. The total variation is less than 10 millibars (less than 1.0 mm of Hg), which cannot be considered very severe alone or in combination with the temperature and humidity.

Other contaminants possibly present could be ozone, increased oxygen, products of decomposition, and micro-organisms, but these or others have not been identified. Time is always a factor and more or less directly applies.

Water is always present in the tropical atmosphere and if a component reacts to the presence of moisture either on its surface or absorbed into its bulk to known degrees, the component performance in the tropics should be predictable. The example of stress testing composition resistors in a 95 to 100 percent relative humidity atmosphere at elevated temperature yielded degradation faster and to a greater degree than did the cycle test.[10] The cycle test can cause moisture uptake to be different owing to differential expansion of multimaterial components. This may be a partial explanation for the failure of the excited RN carbon-film resistors, which has not been fully identified to the same degree in the field tests.

It must be noted from the drying-out cycle that only moisture was removed and recovery was observed in the majority of components. Since moisture is a rate factor for corrosion and fungus growth, it can be concluded that moisture is the major source of degradation for these components

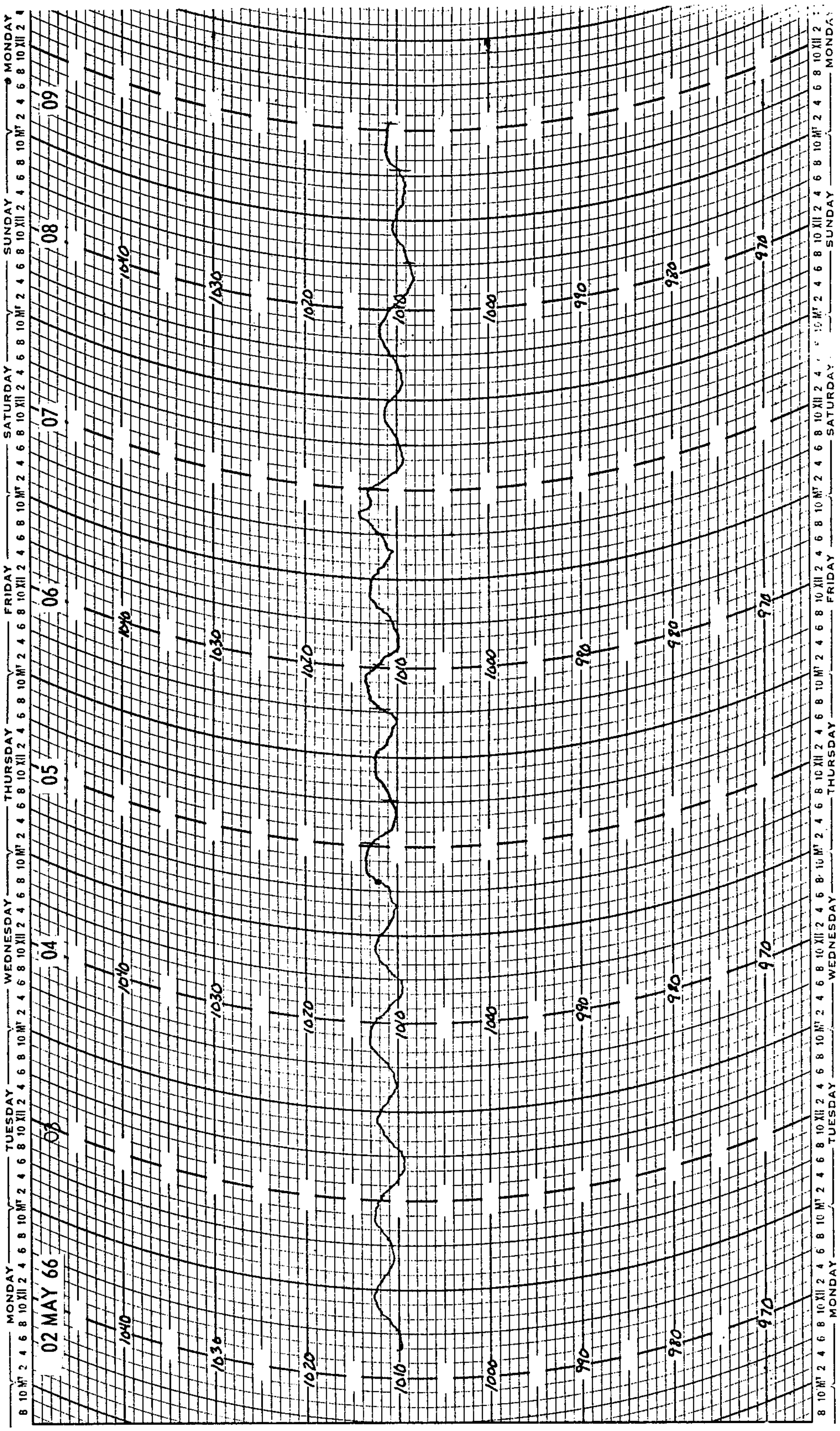


Figure 4. Atmospheric Pressure (Millibars) vs Time (Hours), Galeta Island, TTC Laboratory

## 2.4 Recovery Evaluation

The planned program for the visit to the Canal Zone exposure site included the monitoring of component characteristic changes during a recovery or drying-out period. The 22 month components were removed from the humid tropical environment to the air-conditioned laboratory environment. The shore located components had had data recorded that same day and therefore it was possible to observe increased impedance for certain high impedance components during the first hour due to moisture evaporation resulting in reduced surface conductance. The value of the RN resistors increased approximately 0.1 percent. The dissipation factor for the CK capacitors decreased from 0.038 to 0.005. The capicitance value of the CT capacitors decreased slightly owing to temperature reduction. The reaction of the jungle-located components was similar, but since the previous data had been taken 5 days before the start of this drying cycle, the magnitude of the first increment of change could be in error.

Sample groups of five were selected from each lot and monitored on successive periods of increasing duration. After 4 days, the components were stored in a container with a dessicant material to increase the rate of drying. This was continued until the components had been out of the tropical environments for a total of 2 weeks. The results of the drying are given in the discussion of each component. The last data printout in the summaries, appendix B, and the percent change data plots correspond to the data recorded at the end of the 2 week drying process for all components in each group and lot.

This evaluation was not considered for the 21 September 1965 (Phase II) components of only 7 months of exposure because the drying cycle would be an interruption of the specified minimum 18 months of tropical exposure.

## 2.5 Resistor, Fixed, Composition, RC

The fixed-composition resistors on tropical exposure for 23 months were inspected for visible evidence of degradation and the summary of comments are:

JRC - Slight discoloration of tinned leads.

JERC - Slight discoloration of tinned leads.

SRC - Corrosion products (green) around terminal lead where it enters resistor body - corrosion products at solder joint; all tinning appears to be missing from the component lead.

SERC - Same as SRC above. See figure 5.

### Data Analysis

The composition resistors have, during the 23-month tropical exposure period, increased in value in all lots and groups. This is presented graphically in figure 6. The group summary data are given in table B-1 of appendix B. Failures are:

| | |
|---|---|
| One confirmed catastrophic | SERC-15 |
| One unconfirmed degradation | SRC-18 |

Component SERC-15 did not recover during the 2-week drying cycle, while SRC-18 returned to a value very close to the group mean. These resistors do absorb moisture into the resistor element, which results in the increased values recorded for all tests. From the data there has been some moisture uptake in the control lot over the time period of this program.

The matter of moisture absorption was confirmed by the 2-week drying of the components in the Tropic Test Center Laboratory. The average value of each lot decreased by approximately 350 ohms during the period (the

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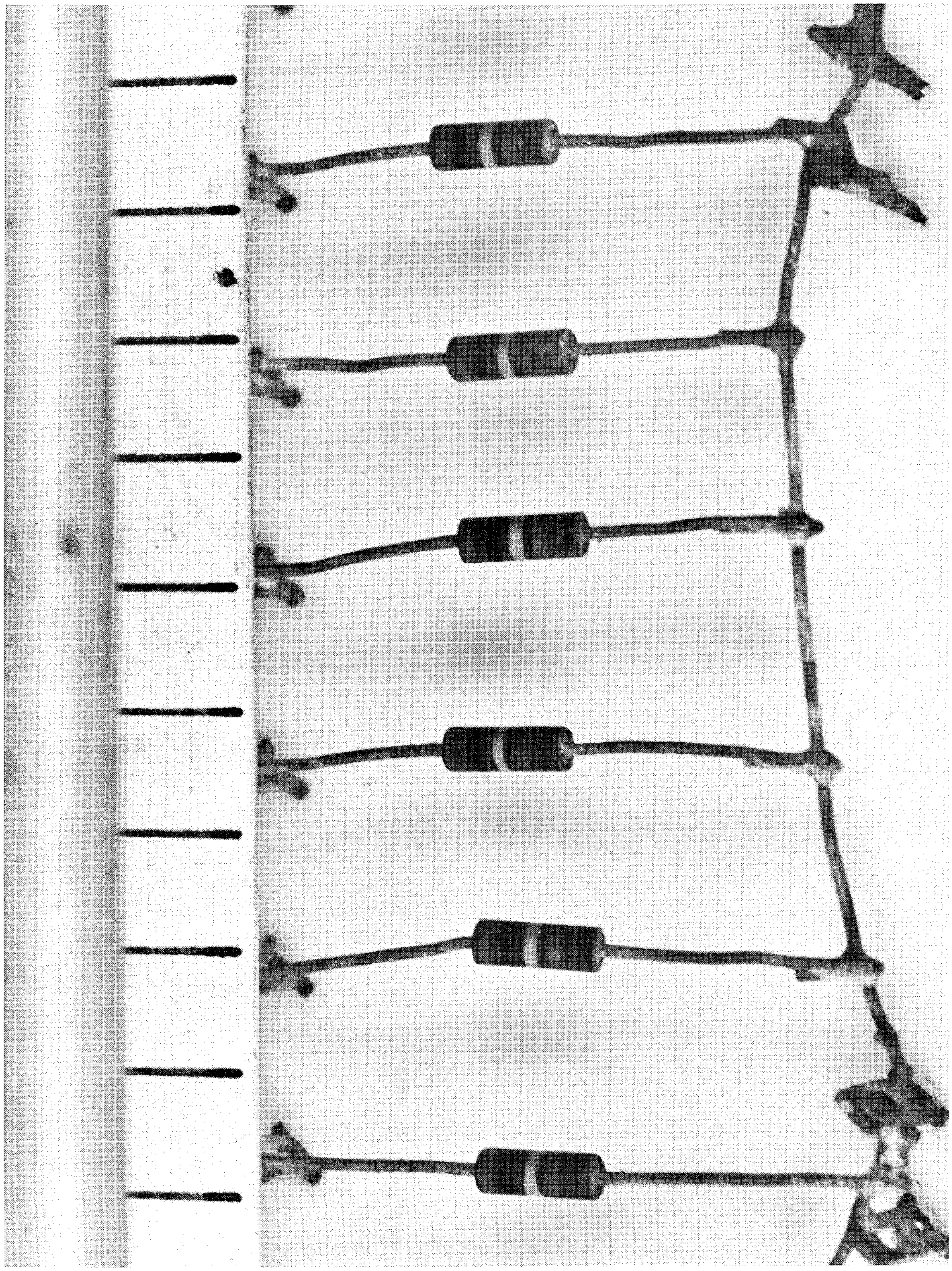
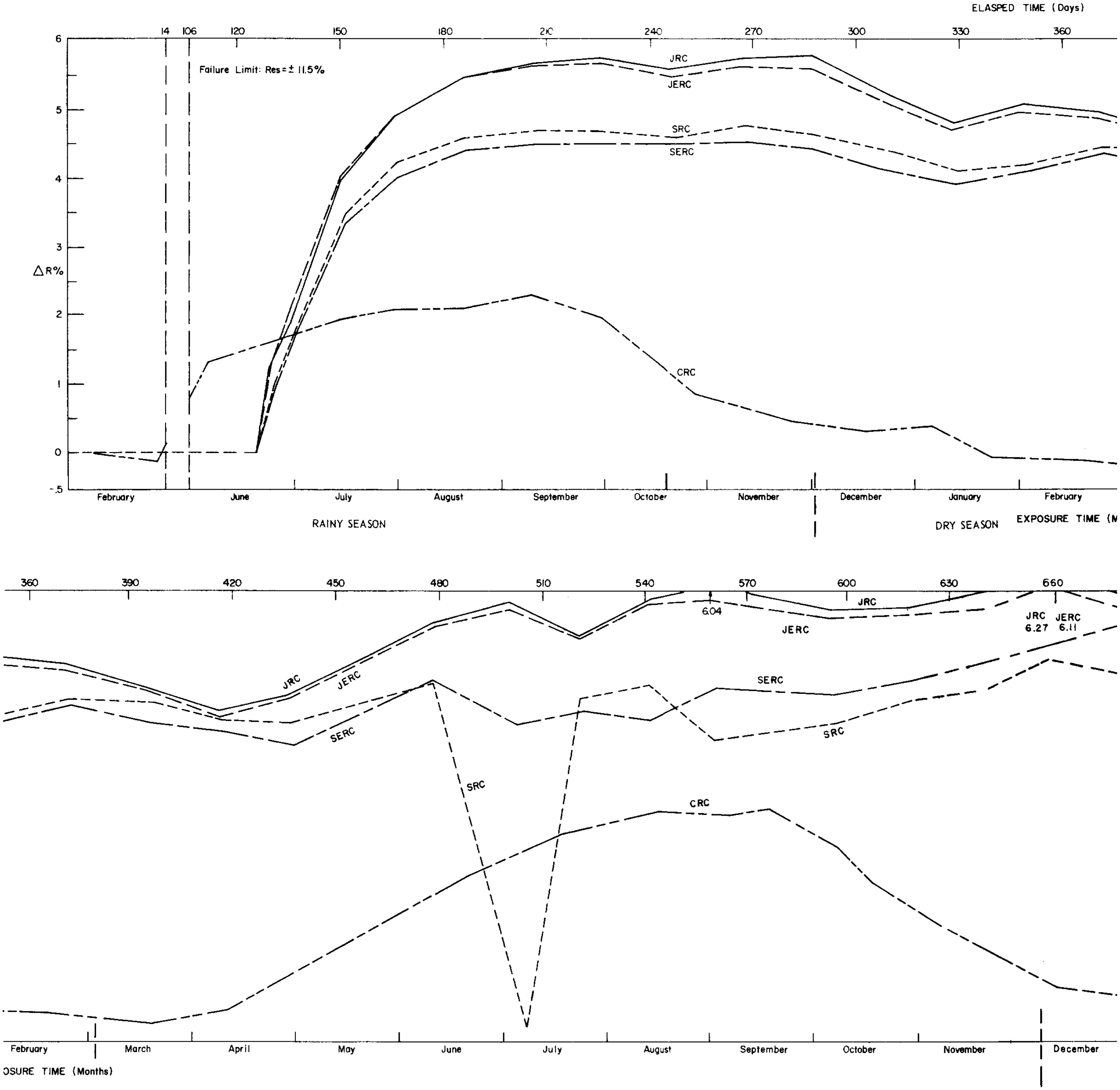


Figure 5. SERC Resistors, Fixed Composition, Corrosion Products at Body/Terminal Lead Interface

E5739


ELASPED TIME (Days)
Failure Limit: Res=± 11.5%
ΔR%
JRC
JERC
SRC
SERC
CRC
RAINY SEASON
DRY SEASON
EXPOSURE TIME (Months)
6.04
JRC 6.27
JERC 6.11
February
March
April
May
June
July
August
September
October
November
December
January

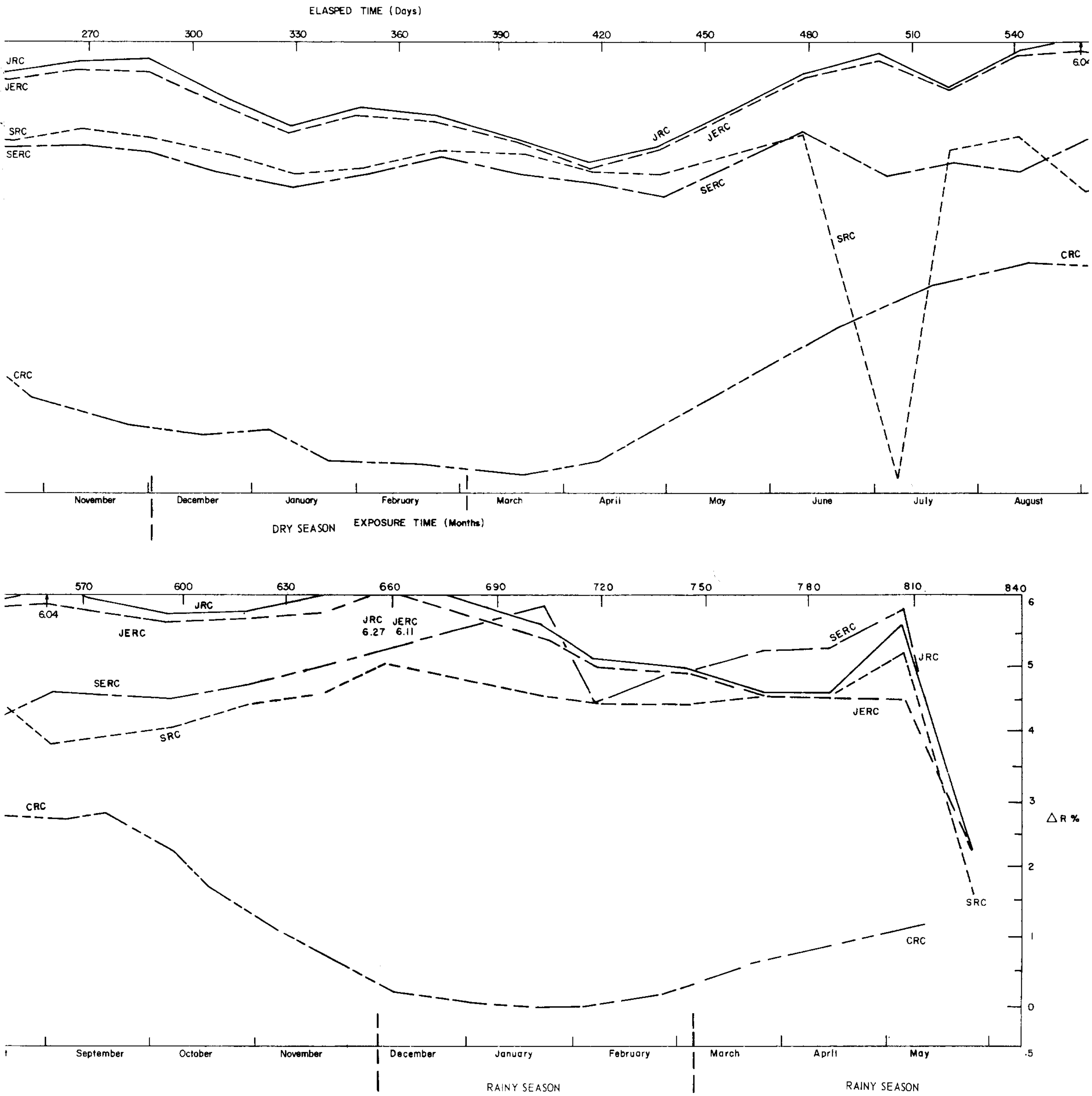



Figure 6. Life Test Group RC

data summary for the SERC's lacks precision owing to the inclusion of the SERC-15 component). The recovery of each 1/5th sample is given in figure 7 and table C-1 of appendix C.

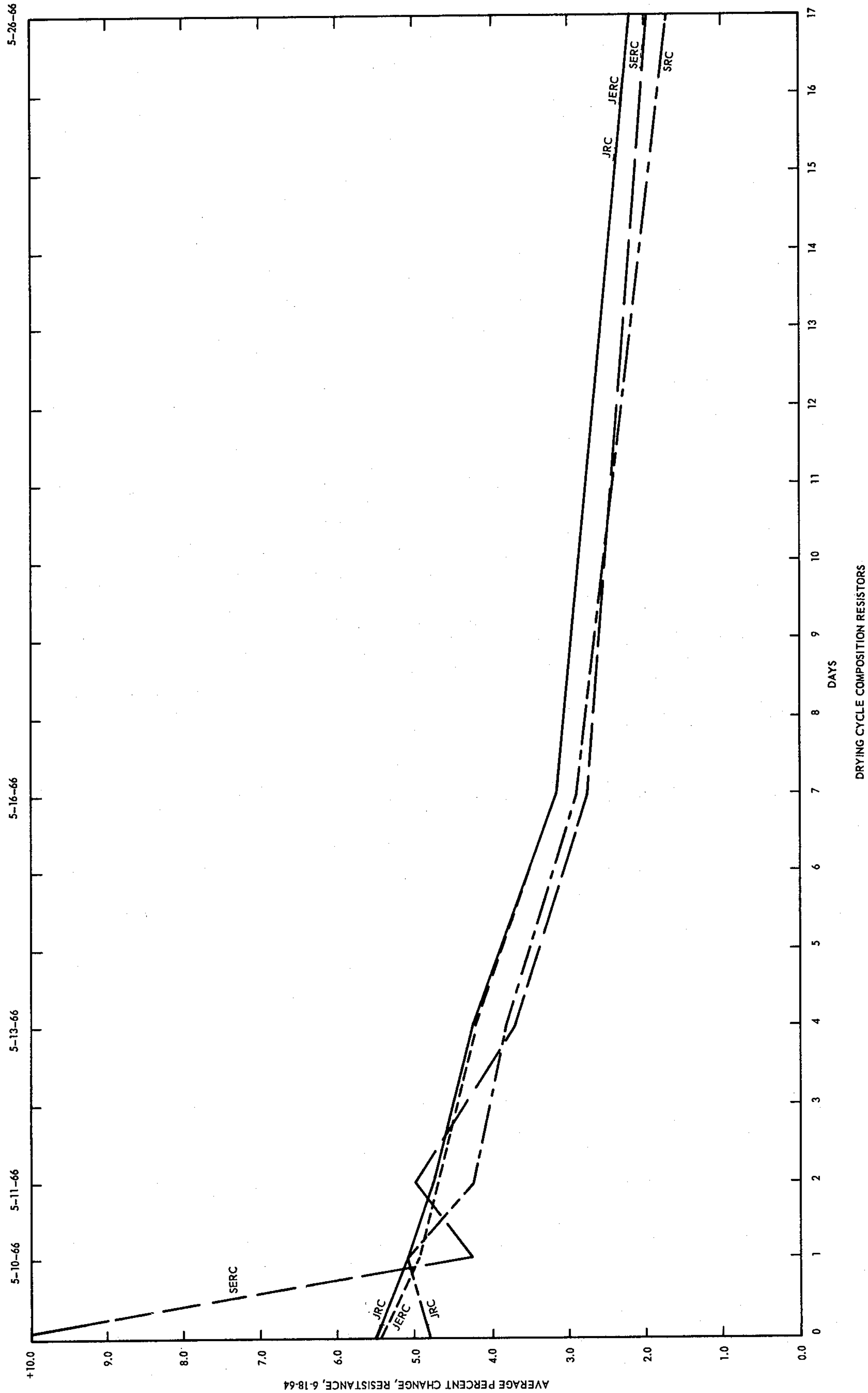



Figure 7. Drying Cycle, Composition Resistors (Group RC)

## 2.6 Resistor, Fixed, Film, RN

The visual inspection of the MIL-type RN carbon-film resistors after 23 months of tropical exposure is summarized as follows:

JRN - Slight discoloration of component leads.

JERN - Slight discoloration of component leads.

SRN - Corrosion at the solder joints.

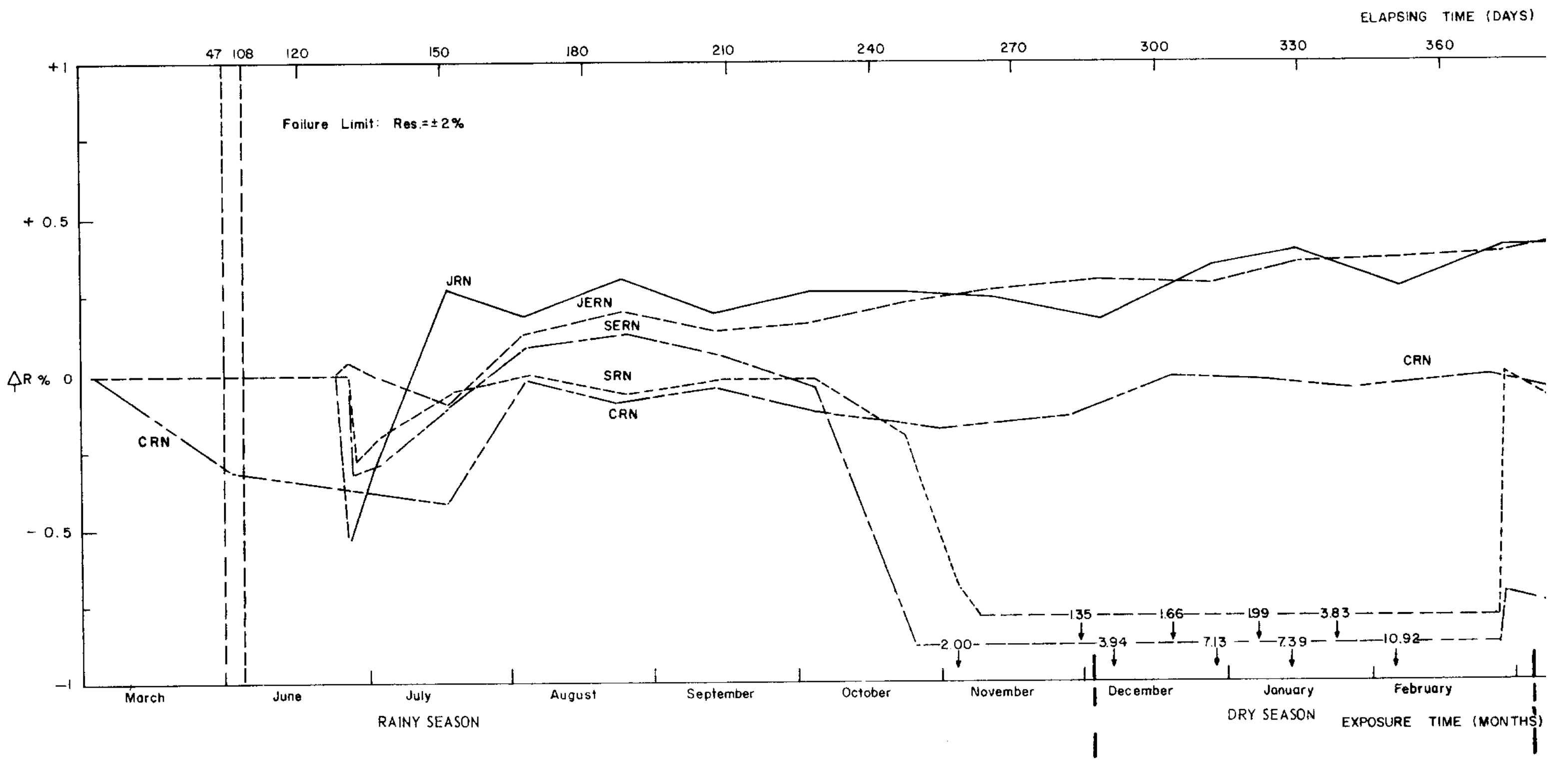
SERN - Corrosion at the solder joints and some corrosion at the lead body interface.

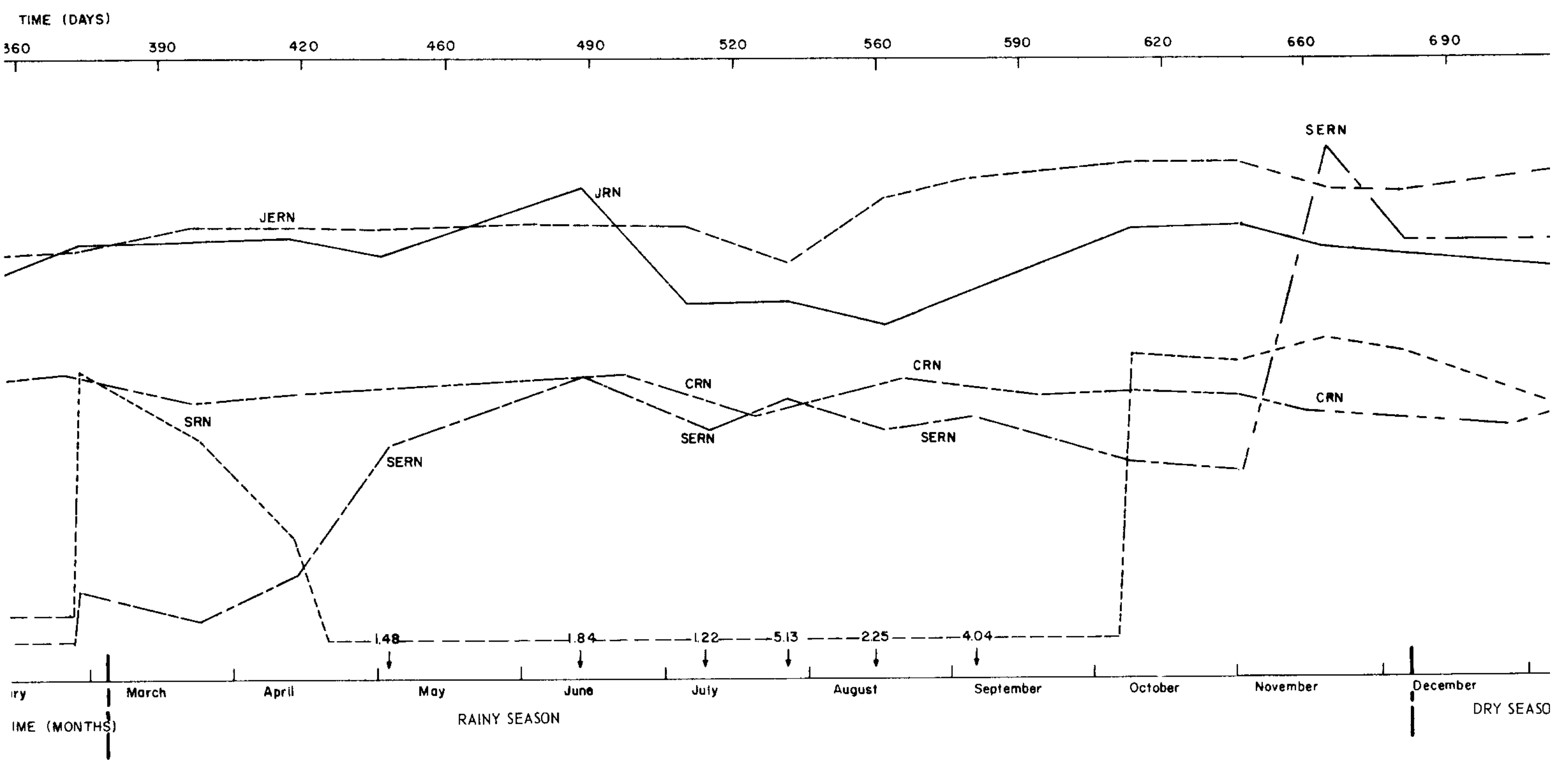
### Data Analysis

The data for the RN film resistors for the 23-month tropic exposure reflect the basic problem of maintaining stability in moderately high impedance circuitry. The effects of salt deposition on the Teflon terminal boards and the component surface have been reported in previous reports. During the third quarter of this contract, the field staff was instructed to decontaminate the component boards prior to each data measurement to eliminate this shunt conductance, which directly affects the measured resistance values. This does not eliminate possible shunting over the component surface.

The data for the past 6 months reveal no failures for the jungle-located components and four confirmed D degradation failures in the SRN group, SRN-4, -14, -17, -20; two confirmed C degradation failures in the SERN group, SERN-14, -20; and two unconfirmed D degradation failures with SERN group, SERN-7, -17. Figure 8 is the graphic summary of the average percent change data for all groups for the 23-month period. The summaries of field and control data are given in table B-2 of appendix B.

E5728


ELAPSING TIME (DAYS)
47 108 120 150 180 210 240 270 300 330 360
+1
+ 0.5
ΔR % 0
- 0.5
-1
Failure Limit: Res.=±2%
JRN
JERN
SERN
SRN
CRN
2.00
1.35
1.66
1.99
3.83
3.94
7.13
7.39
10.92
March
June
July
August
September
October
November
December
January
February
RAINY SEASON
DRY SEASON
EXPOSURE TIME (MONTHS)


TIME (DAYS)
360 390 420 460 490 520 560 590 620 660 690
JERN
JRN
SERN
CRN
SRN
1.48
1.84
1.22
5.13
2.25
4.04
March
April
May
June
July
August
September
October
November
December
RAINY SEASON
DRY SEASO
IME (MONTHS)

(1)

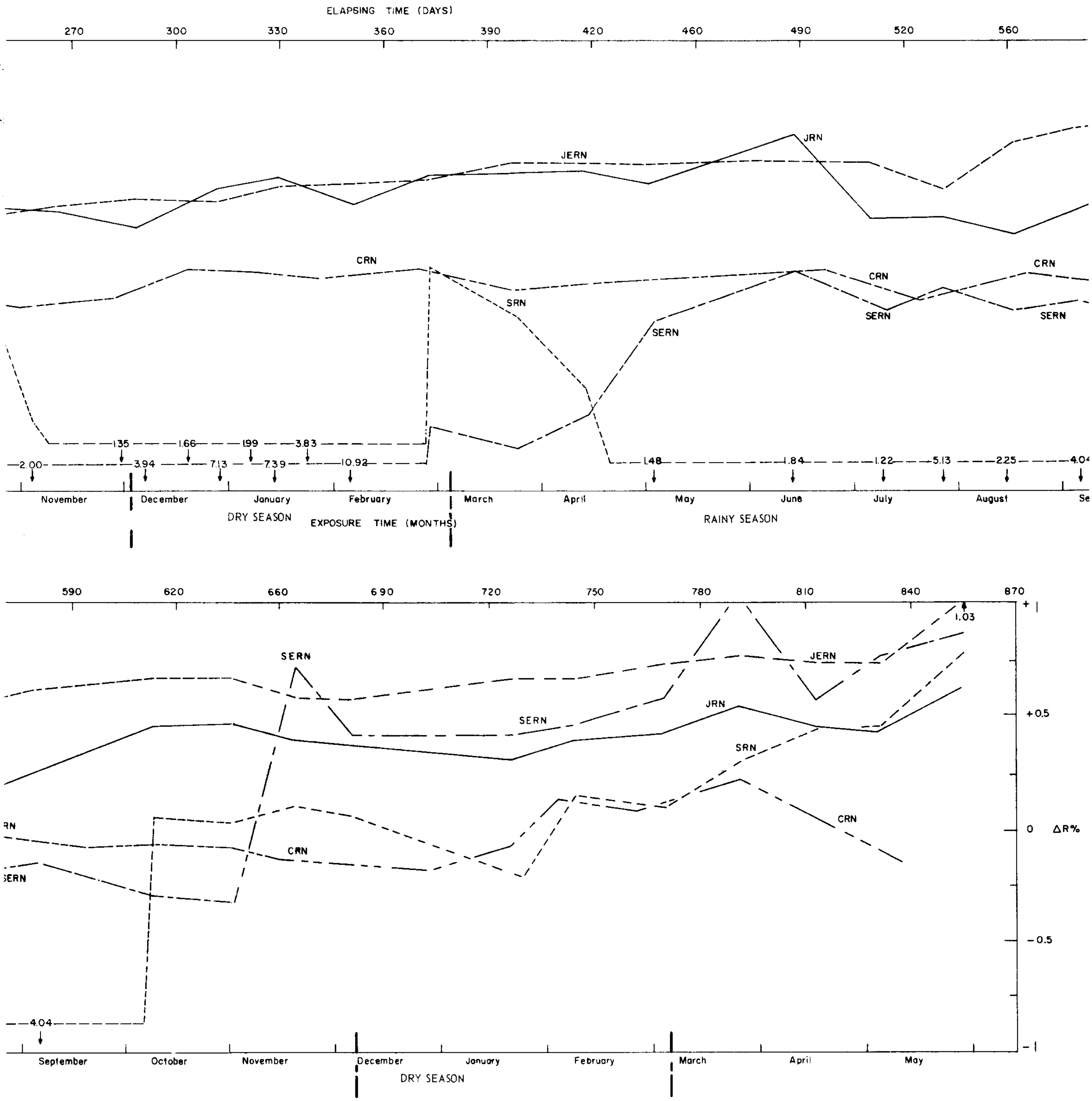



Figure 8. Life Test Group RN



2

The drying-out period of 2 weeks yielded indications of surface moisture evaporation as reflected in resistance increase within the first hour. The plot in figure 9 shows the percent change of the samples of five components per lot for the 2-week period. The major effect occurs within the first day. The data summaries for these selected components are given in table C-2 of appendix C.

Inspection of the data for the past 6 months indicates the possibility of an increase in resistance of the carbon film, but this increase is neutralized by the conductance of the moisture film present on the surface. This is best derived from the JERN data; e.g., the mean value was 99.98 kilohms on 8 December 1965, increasing to 100.18 kilohms on 23 March 1966 (the spring dry season), and slightly decreasing for the next two data points prior to the drying cycle during which the mean value increased to 100.42 kilohms. The elimination of surface shunting due to moisture allows the measured value to increase. The value of percent change of each resistor increased to an average of greater than 1 percent. Drying out did not restore these components to their original value. One explanation of what occurred was given for the performance of the AERN Laboratory Test Group, Second Quarterly Report, Reference 10. The AERN resistors developed a mechanism that resulted in ever-increasing resistance. They did not recover when removed from the test chamber. In discussions with representatives of USACOM, it is understood that this phenomenon has been observed in industry, but reports have not been published. Therefore, a reference cannot be given.

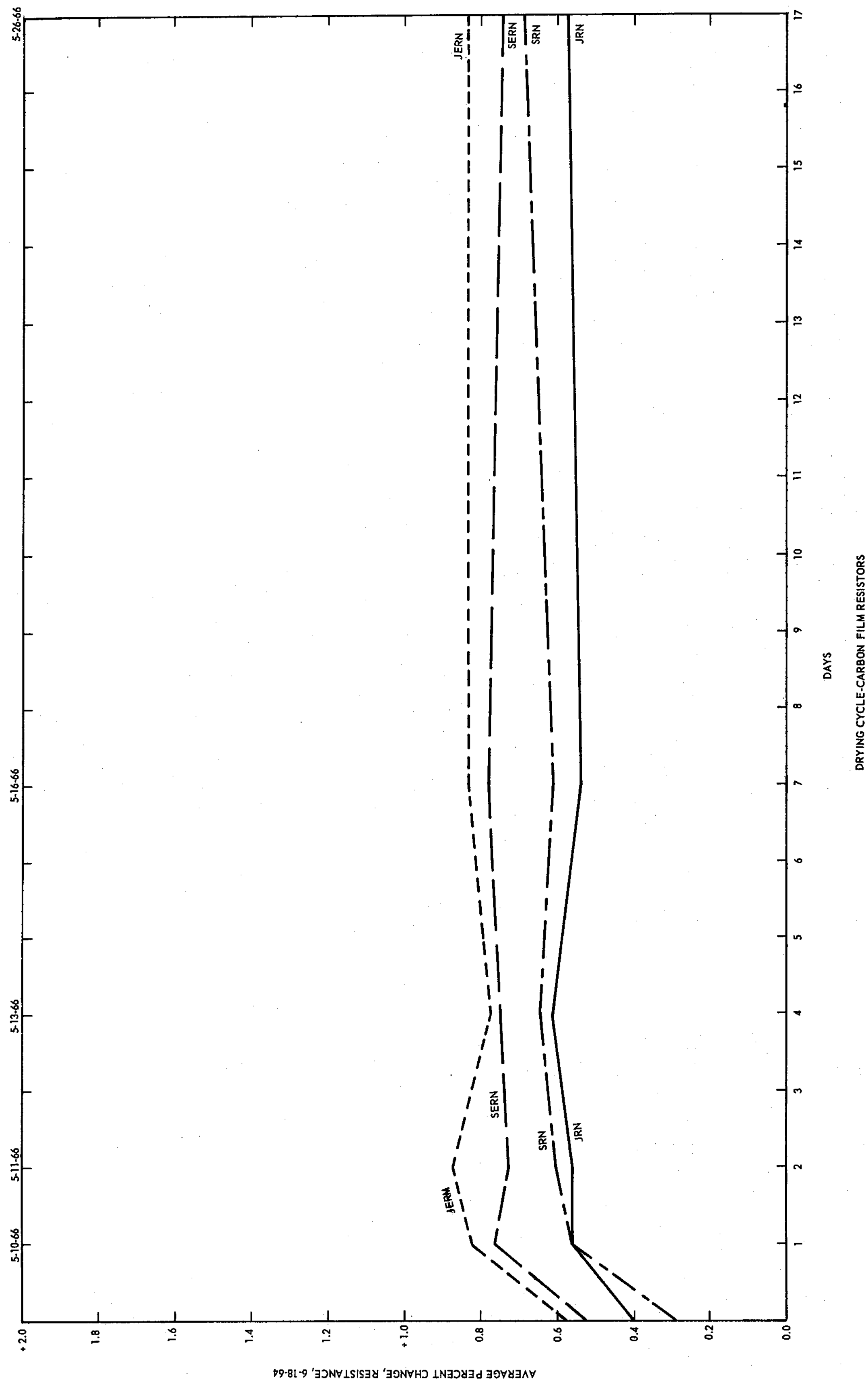



Figure 9. Drying Cycle, Carbon-Film Resistors (Group RN)

The JRN group also increased during the 2-week drying cycle, but the final percent change is less; i.e., only 0.64 versus 1.03 for the excited resistors. This is a strong indication that the previously mentioned degradation from the electrolysis may be a failure mechanism for these components.

The performance of the SRN or SERN groups is similar except for the failures previously mentioned.

## 2.7 Resistor, Fixed, Wire-Wound, RW

The visual inspection of the wire-wound resistors, after 23 months of tropical exposure, is summarized as follows:

JRW - Slight discoloration of leads.

JERW - Slight discoloration of leads.

SRW - Corrosion of end caps under vitreous coating, faded appearance and minor corrosion at lead-body interface.

SERW - 50 percent have brown (rust) on the non-common end of the resistors (the common end was very clean), corrosion at the solder joint and also copper corrosion.

Figure 10 is a photograph of the shore-located RW resistors. The discoloration spots are considered evidence of corrosion involving the end caps and the resistance wire.

### Data Analysis

The wire-wound resistors, RW, have exhibited stability for the 23 months of tropical exposure. As was reported in the second quarterly report,[10] there appear to be corrosion reactions which, with sufficient time, could result in failure. The only indicated failure is an unconfirmed C degradation for component SERW-2. The data for this were recorded at the conclusion of the 3-week dry-out cycle. Since this component has not previously evidenced degradation, this failure must be defined as unconfirmed. Figure 11 is the graphic presentation of the data for all lots of RW resistors. The processed data summaries for the field and control component groups are given in table B-3 of appendix B.

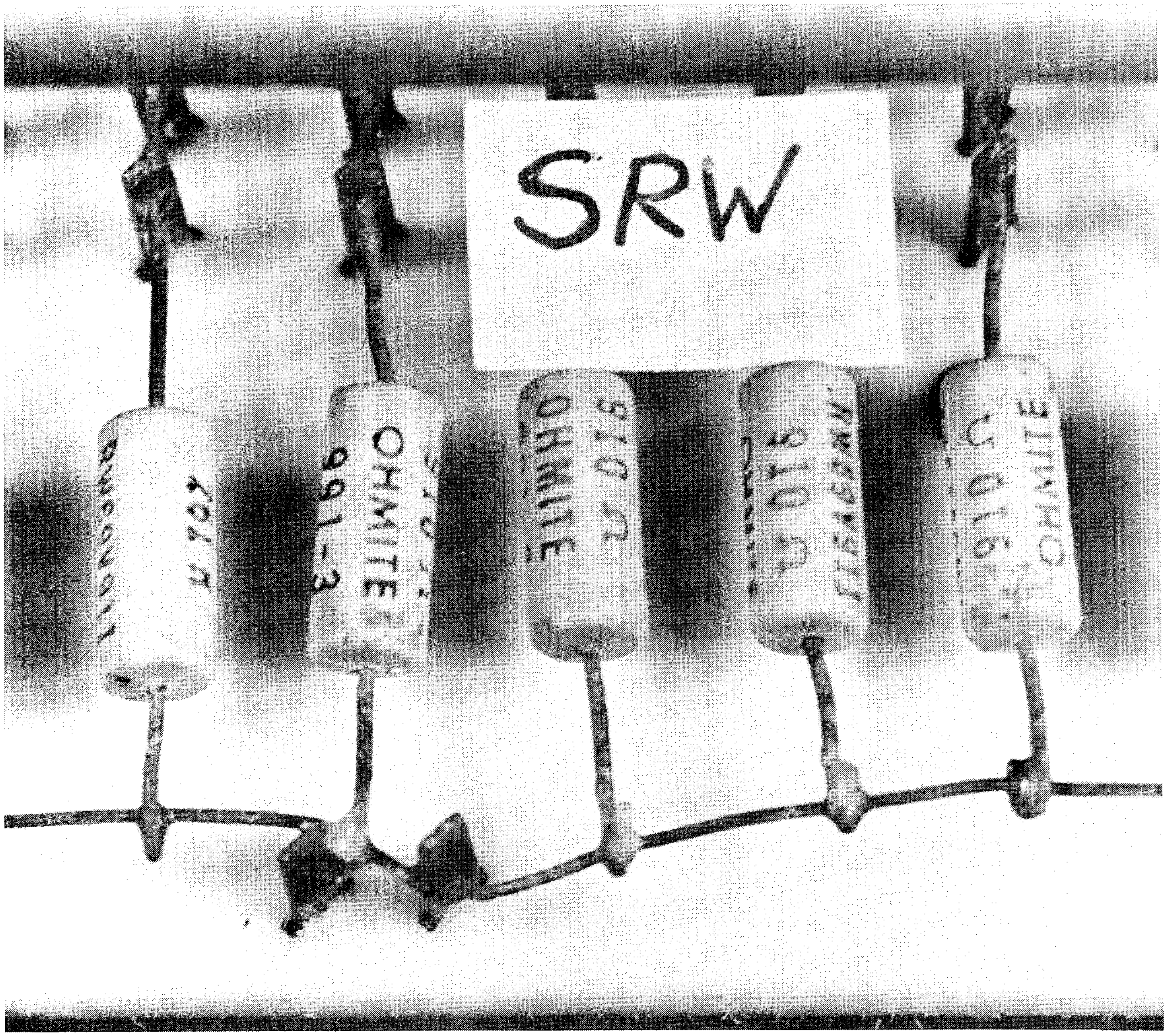
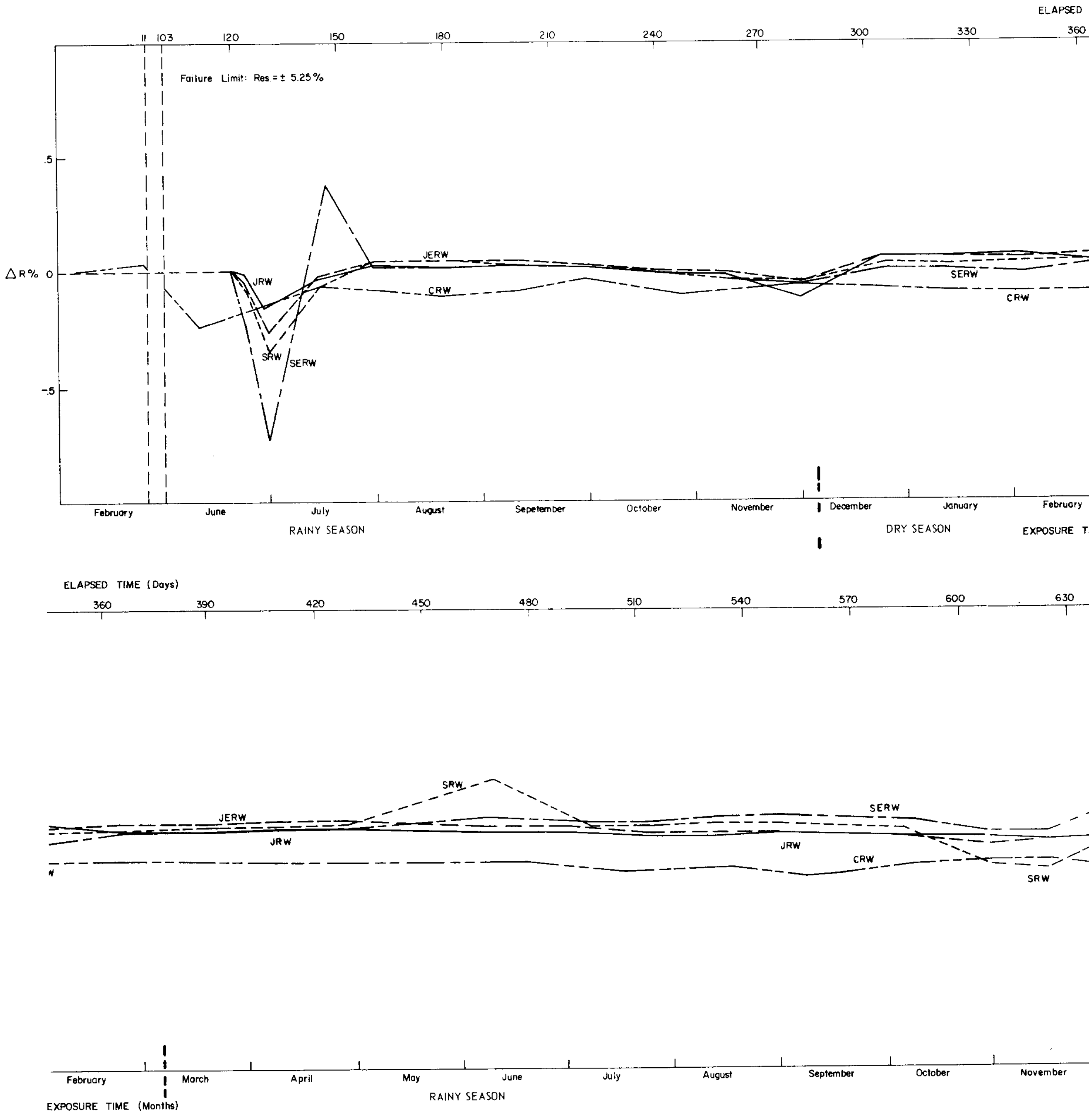



Figure 10. SRW Resistor, Fixed Wirewound, Evidence of Corrosion Products

E5741


ELAPSED
11
103
120
150
180
210
240
270
300
330
360
Failure Limit: Res.= ± 5.25%
.5
ΔR% 0
-.5
JERW
JRW
CRW
SRW
SERW
February
June
July
August
Sepetember
October
November
December
January
February
RAINY SEASON
DRY SEASON
EXPOSURE T
ELAPSED TIME (Days)
360
390
420
450
480
510
540
570
600
630
SRW
JERW
JRW
SERW
JRW
CRW
SRW
February
March
April
May
June
July
August
September
October
November
EXPOSURE TIME (Months)
RAINY SEASON

1

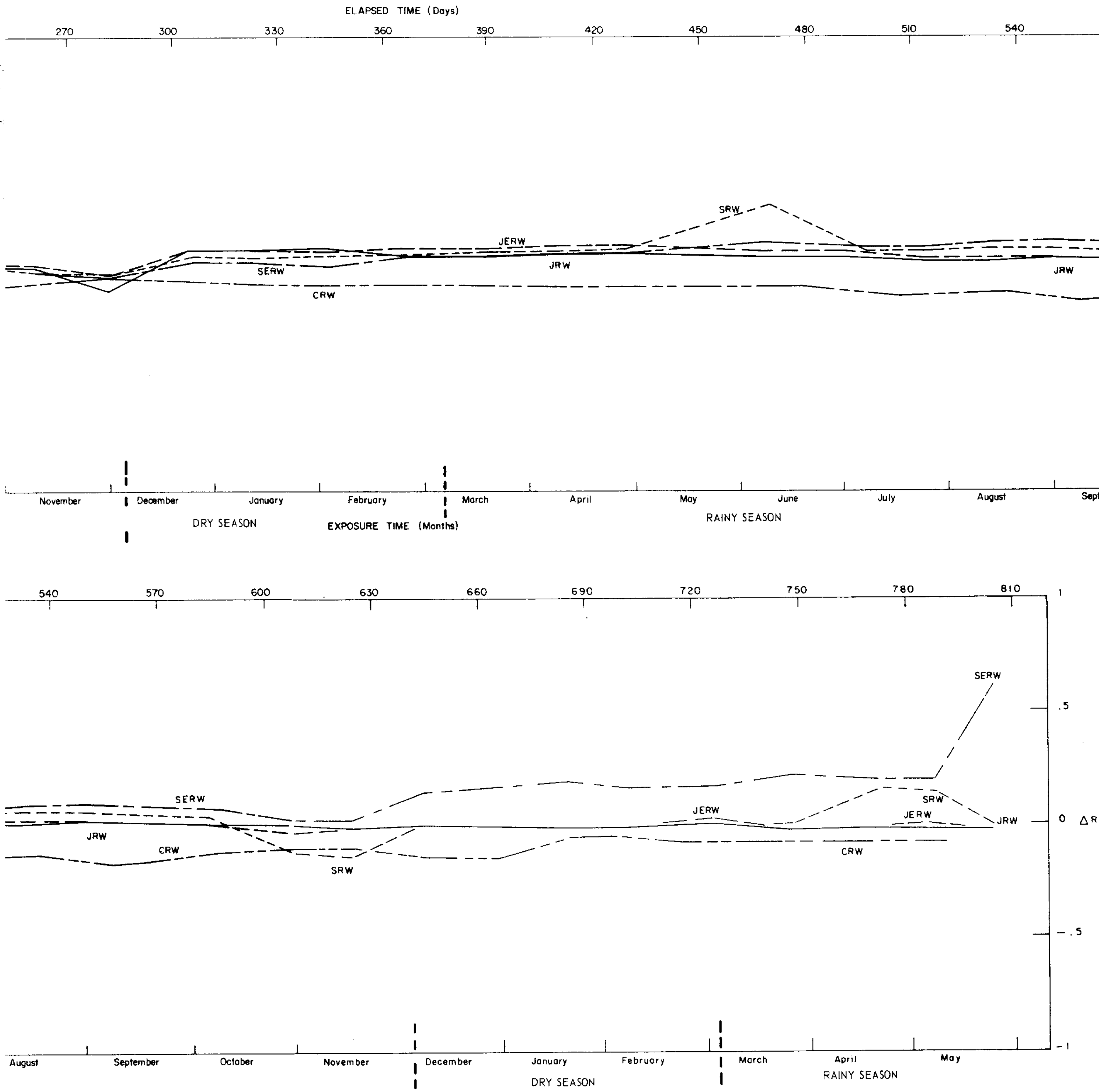



Figure 11. Life Test Group RW

Other components in the tropical exposure lots of RW resistors have evidenced degradation during the past 6 months and this degradation was not modified by the 2-week drying-out cycle. The performance of the components selected for observation during the drying period is shown graphically in figure 12 and summarized in table C-3 of appendix C.

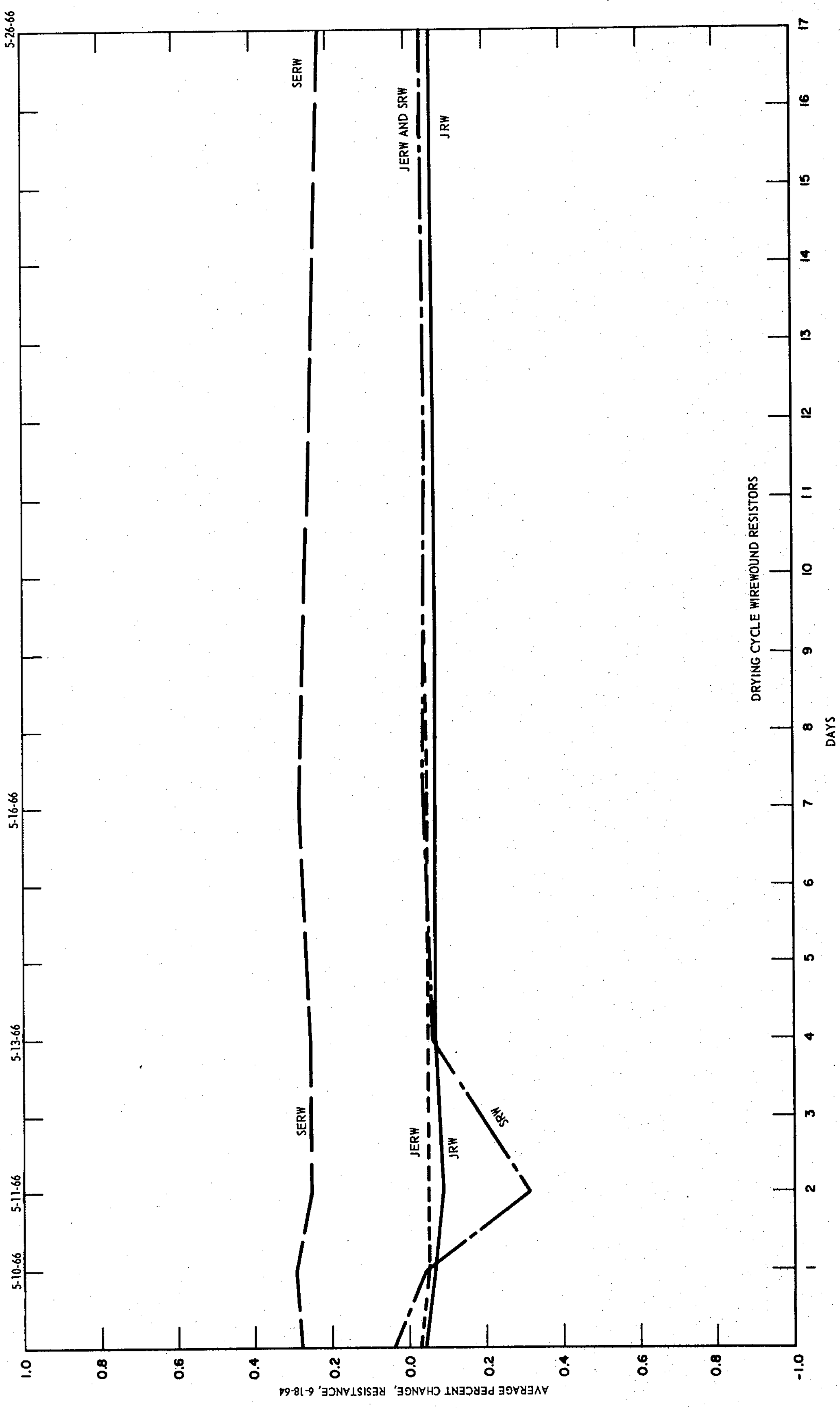



Figure 12. Drying Cycle, Wirewound Resistors (Group RW)

2.8 Capacitor, Fixed, Tantalum, CS

The visible effects from 23 months of tropic exposure on the MIL-type CS-13A capacitors are summarized here:

JCS - Plastic jacket secure, with no evidence of swelling; solder at seal is very bright and body lead is discolored.

JECS - Same comments as JCS above.

SCS - Plastic sleeves are peeling back, combined with a general swelling of the plastic; there is general oxidizing or corrosion of leads and corrosion of solder joints.

SECS - Same comments as SCS above.

The general appearance, lead corrosion, and swelling of the insulating sleeve for the shore-located units is illustrated in figure 13.

Data Analysis

The CS tantalum capacitors have withstood the 23 months of tropical exposure without any drastic changes in capacitance value. The increase in the dissipation factor beyond limits owing to shunt leakage across the terminal seal caused a few failures. Two units, SECS-16 and -25, appear to have failed just prior to the May 1966 drying period and recovery was not achieved by drying the units. These two units are noted as "unable to obtain valid data," which could be an open circuit owing to corrosion or a short circuit internal to the capacitor.

The performance of the CS tantalum electrolytic capacitors as revealed in average value change gives the impression of erratic performance during the late rainy season with recovery during the dry season. Figure 14 is the graphic presentation and table B-4 of appendix B is the summary of

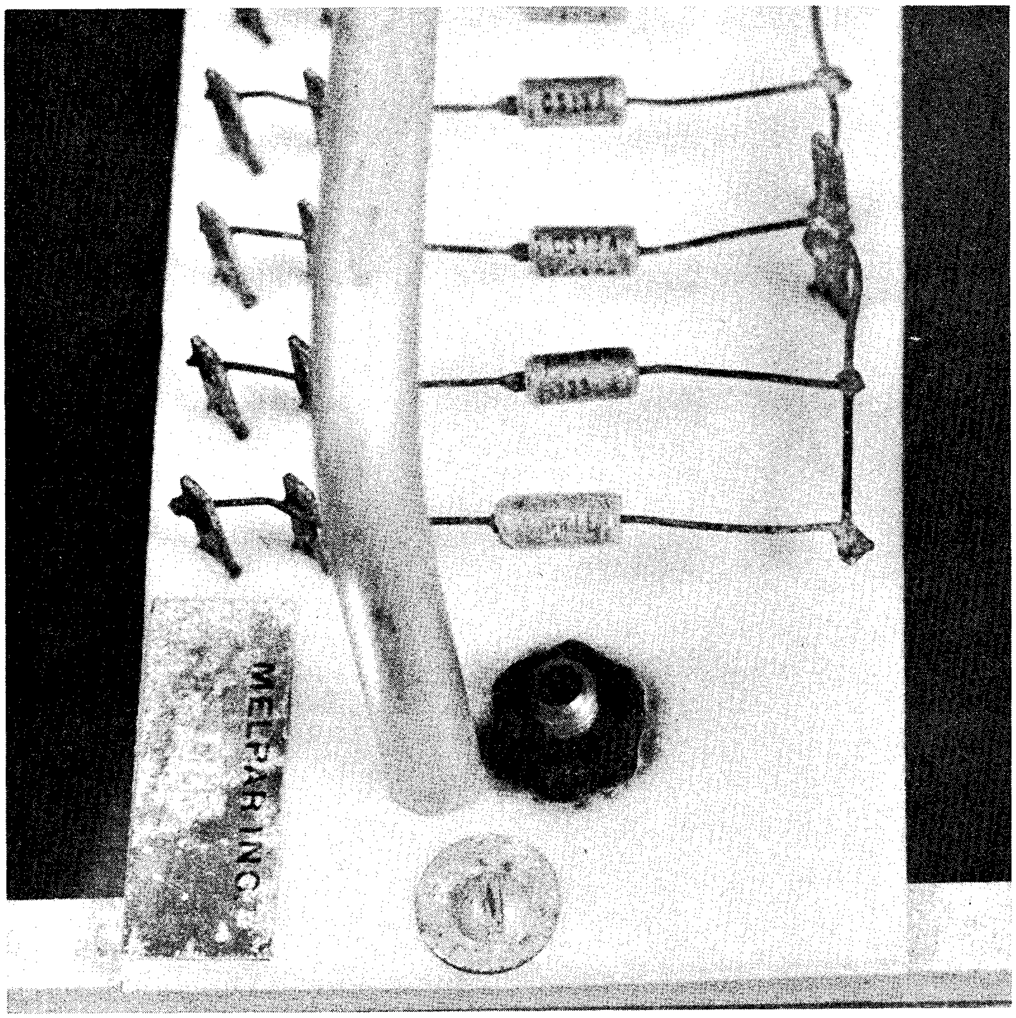
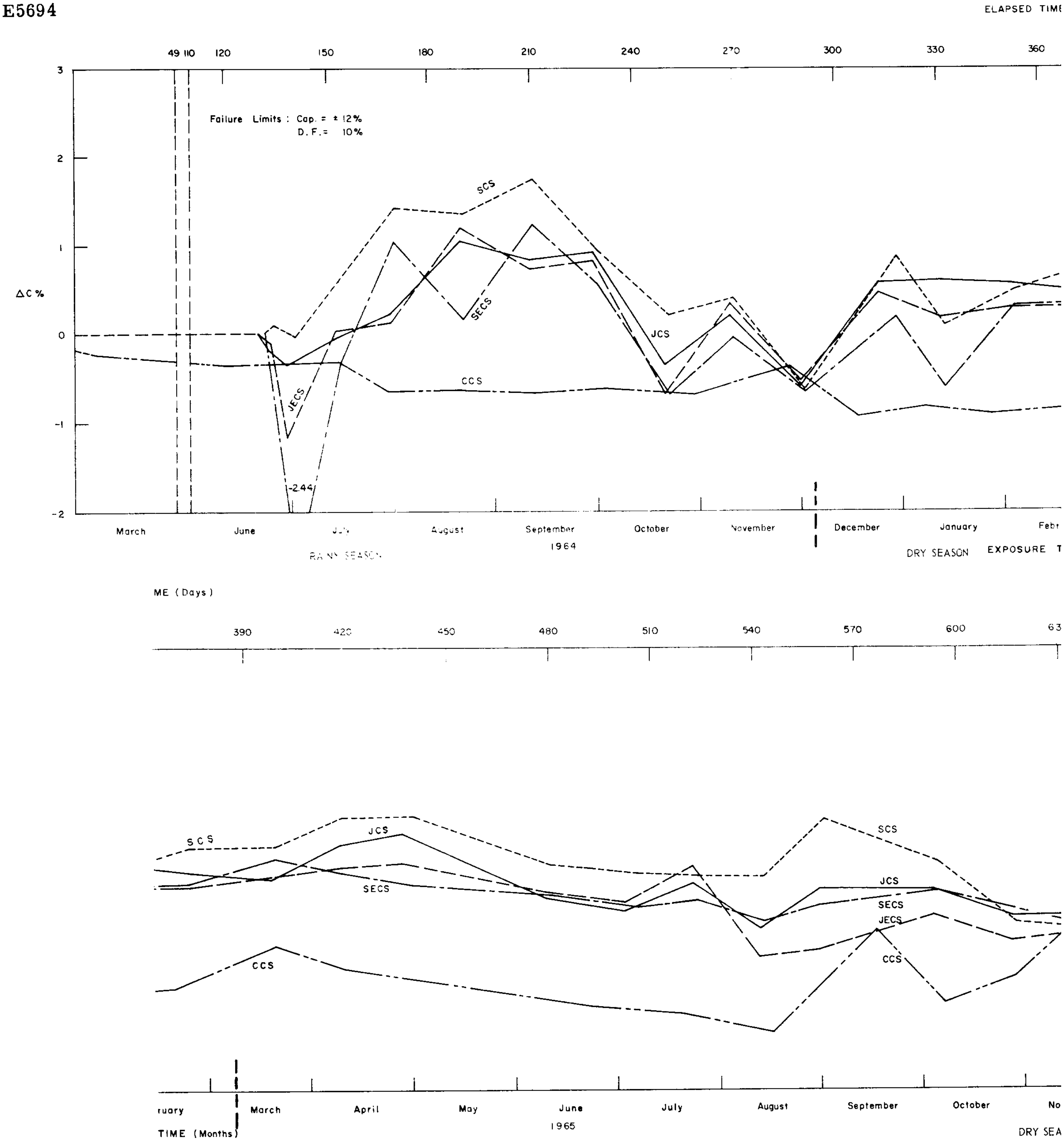



Figure 13. SCS Capacitor, Fixed, Tantalum, Electrolytic. Swelling of Plastic Sleeve Due to Salt and Moisture

E5694



ELAPSED TIME (Days)
49 110 120 150 180 210 240 270 300 330 360
390 420 450 480 510 540 570 600 63
3
2
1
0
-1
-2
ΔC %
Failure Limits : Cap. = ± 12%
D. F. = 10%
SCS
SECS
JCS
JECS
CCS
-2.44
March
June
July
August
September
October
November
December
January
Febr
1964
RAINY SEASON
DRY SEASON
EXPOSURE TIME (Months)
S C S
JCS
SECS
CCS
ruary
March
April
May
June
July
August
September
October
No
1965
DRY SEA

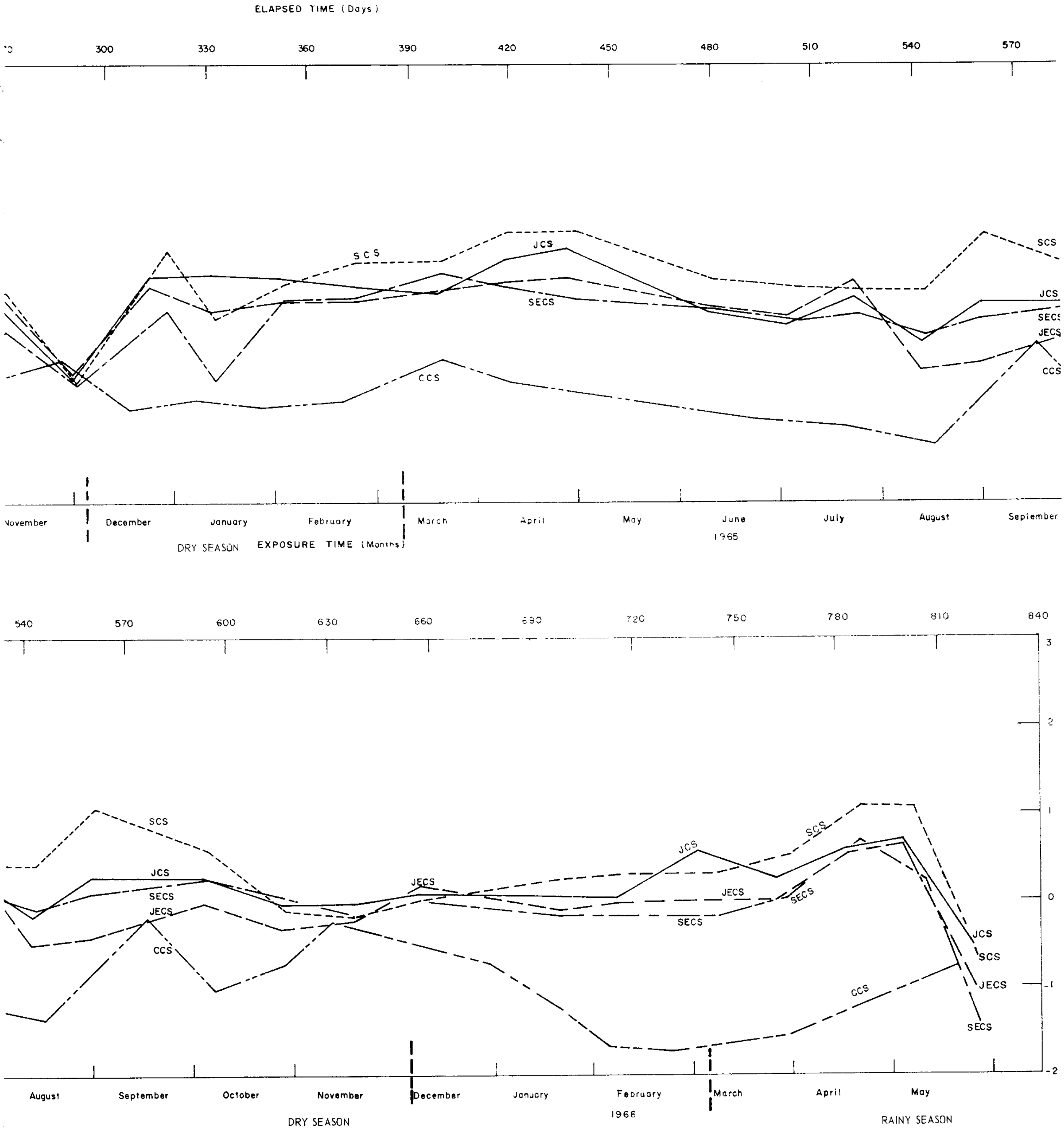



Figure 14. Life Test Group CS

the data for the field and control groups. The 2-week drying cycle resulted in reduction in the average value for all lots. The drying cycle also interrupted the initial effects of the rainy season. The rate of change of capacitance during the drying cycle was observed to be abrupt for the first increment followed by a gradual change, (figure 15). The dissipation factor decreased more uniformly over a range of 0.2 per cent during the 12-day cycle. The summaries of data taken during the drying cycle are given in table C-4 of appendix C.

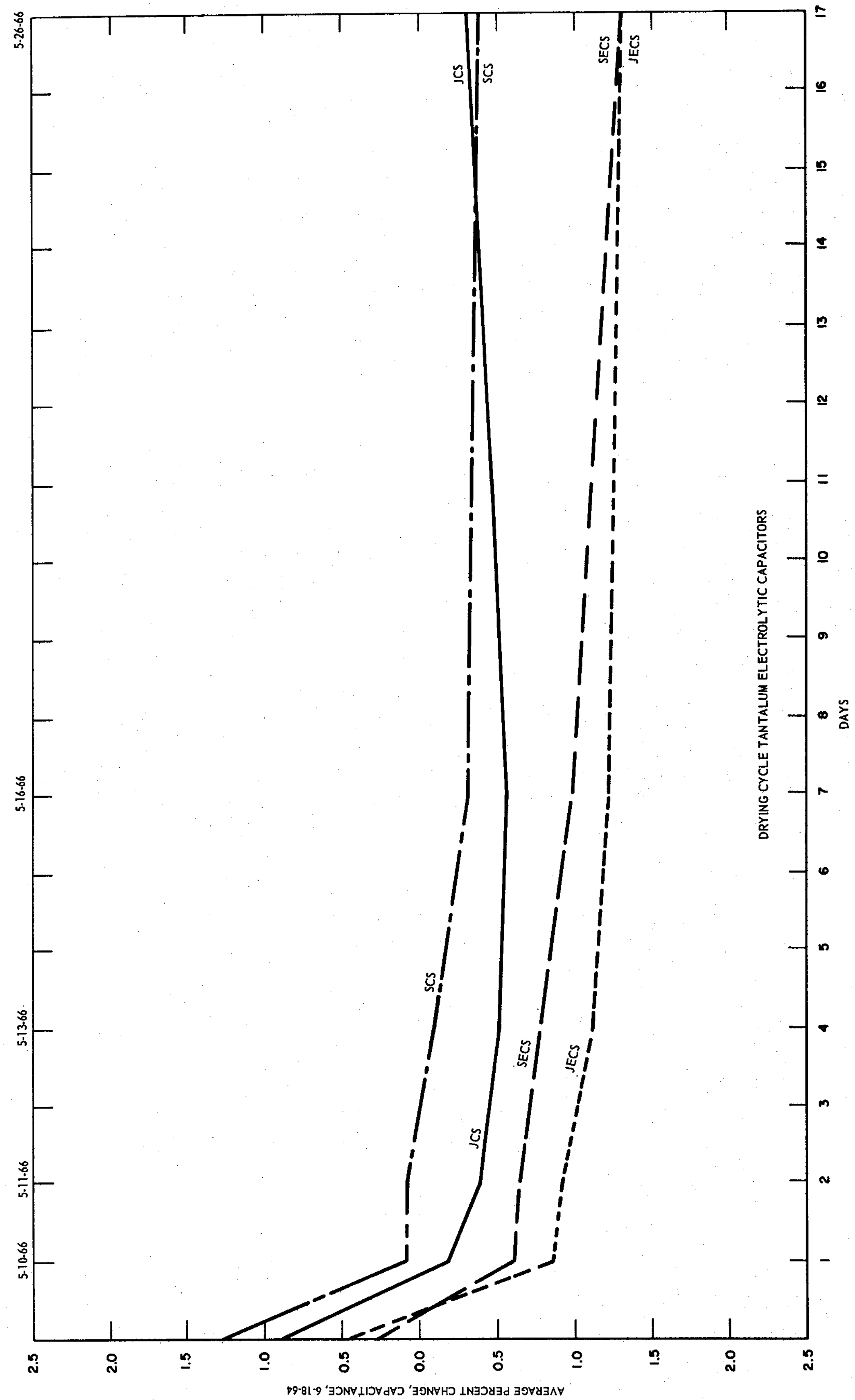



**Figure 15. Drying Cycle, Tantalum Electrolytic Capacitors (Group CS)**

2.9 Capacitor, Fixed, Ceramic, CK

The MIL-type CK12 ceramic capacitors during 23 months of tropical exposure have evidenced various degrees of degradation. A summary of their physical appearance is given here:

JCK - Slight corrosion on common leads and faint corrosion on individual leads

JECK - No corrosion at lead-body interface with faint discoloration of the lead wire

SCK - Slight lead corrosion

SECK - Two broken capacitors; corrosion present at body-lead interface on the individual lead end. (See figure 16.)

Data Analysis

The CK ceramic capacitors have exhibited great degradation and failure at different periods during the 23 months of tropical exposure. Recovery has been accomplished by washing the terminal boards periodically and the components on a single occasion. The jungle data indicate rather severe degradation during the October-December rainy season followed by recovery during the December-March dry season. The shore data for the same period are similar, but with the degradation spread over a longer period and with less tendency to recover. Figure 17 is the graphical presentation of the percent change for each lot of capacitors for the program to date. Summary data for the field and control groups are given in table B-5 of appendix B.

The recovery of these components when allowed to dry out for 2 weeks is evidenced primarily in the reduction of the dissipation factor. Also,

E5766
REF: 5315.00100-13

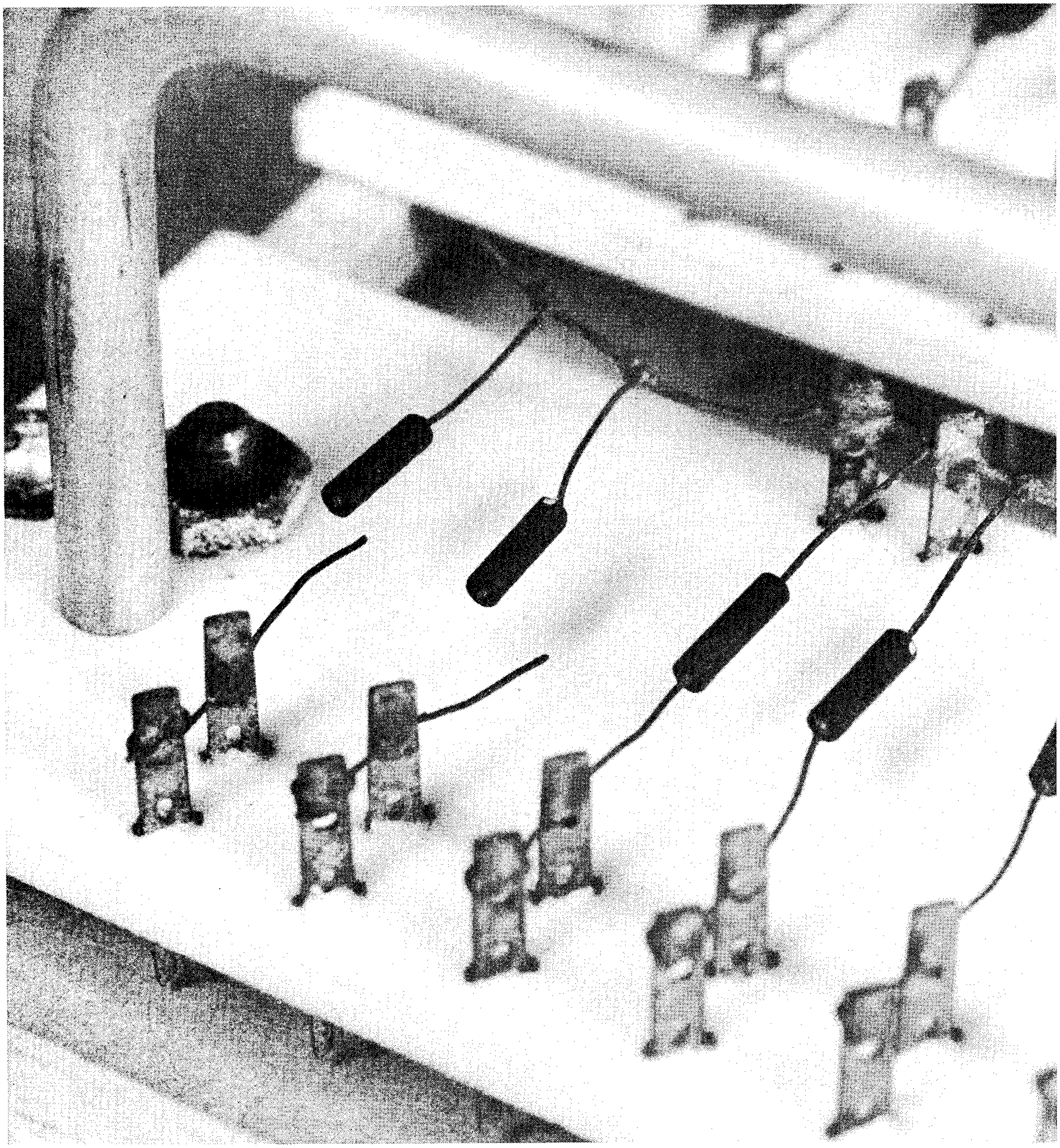
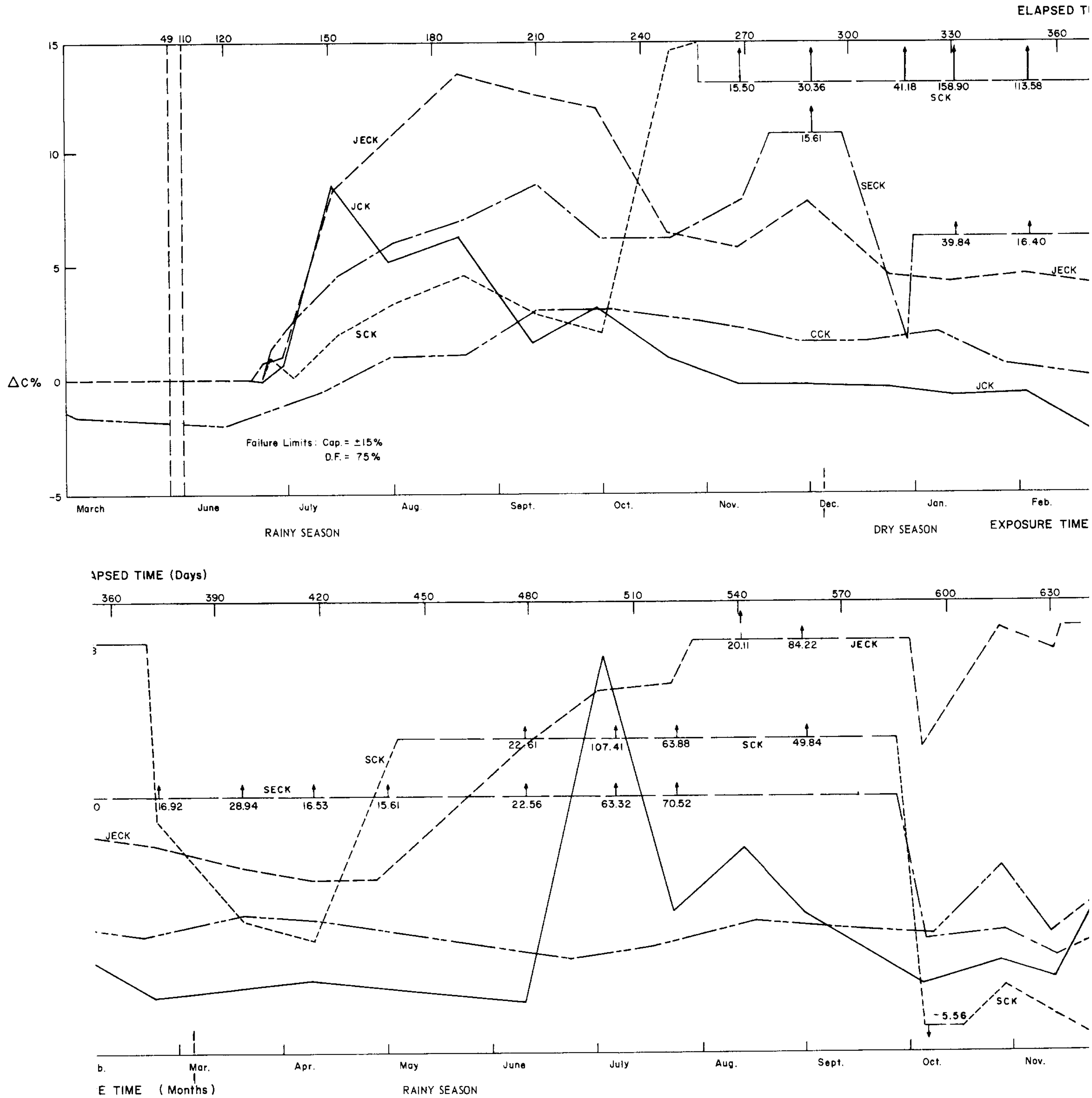


Figure 16. SECK Capacitor, Fixed Ceramic, Corrosion of Terminals and Leads

E5676


ELAPSED TI
49 110 120 150 180 210 240 270 300 330 360
15
10
5
0
-5
ΔC%
JECK
JCK
SCK
SECK
CCK
15.50
30.36
41.18
158.90
113.58
15.61
39.84
16.40
Failure Limits: Cap. = ±15%
D.F. = 75%
March
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
RAINY SEASON
DRY SEASON
EXPOSURE TIME
APSED TIME (Days)
360 390 420 450 480 510 540 570 600 630
20.11
84.22
22.61
107.41
63.88
49.84
16.92
28.94
16.53
15.61
22.56
63.32
70.52
-5.56
b.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
E TIME (Months)
RAINY SEASON

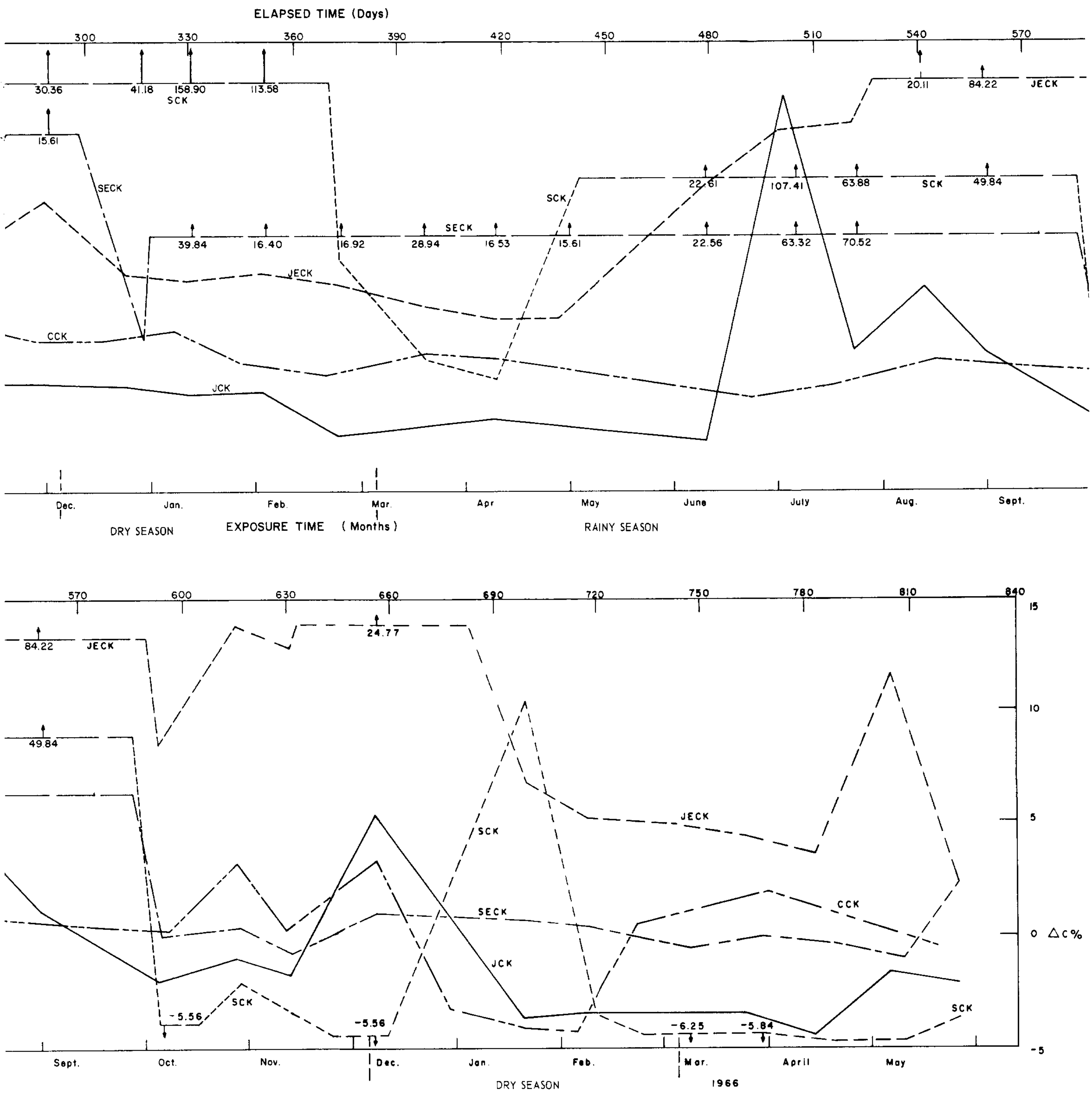



Figure 17. Life Test Group CK

after the drying out, there were only three noted failures, two of which were from corroded leads. The data taken for five samples from each group are presented in summary form in table C-5 of appendix C and are plotted in figure 18. The recovery is fairly rapid during the first 2 days.

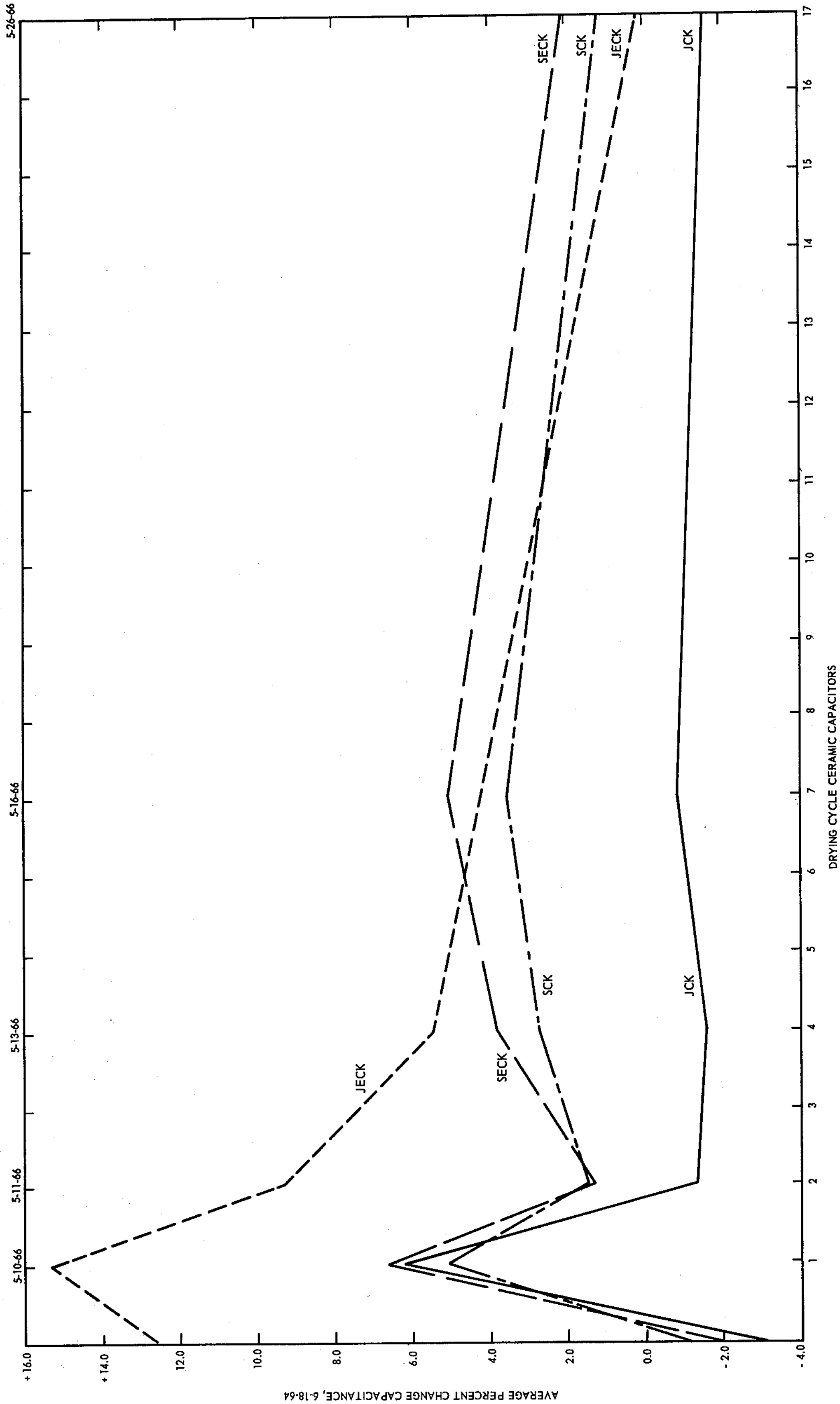



Figure 18. Drying Cycle, Ceramic Capacitors (Group CK)

2.10 Capacitor, Fixed, Mylar, CT

The Mylar capacitors were visually inspected for evidence of degradation. The effects of 23 months of tropical exposure are summarized here:

JCT - No visible evidence of degradation.

JECT - No visible evidence of degradation.

SCT - General lead corrosion.

SECT - There were several (3 or 4) units with green surface tracks (CuCl) from the noncommon leads across the plastic surface (a possible migration phenomenon).

Data Analysis

Tropical exposure of 23 months for the CT, Mylar capacitors has produced failures as reflected by the recorded data.

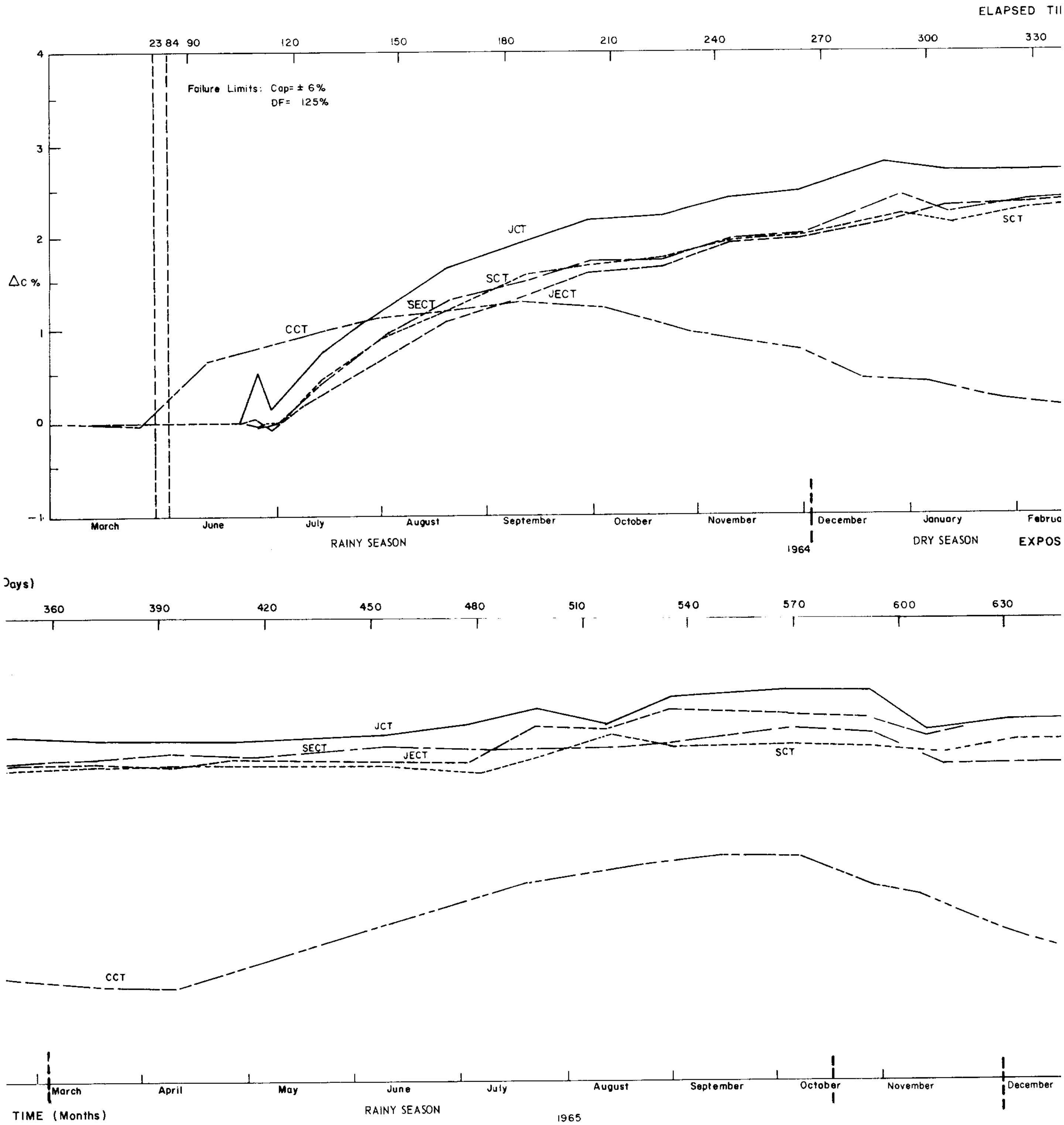
12 unconfirmed D degradation failures: JECT -21, SCT-2, -11, -12, -14, -17, -25, and SECT -5, -19, -20, -24, -25.

Five unconfirmed C degradation failures: SCT -11, -12, -18, -20, SECT -7.

The unconfirmed failures were noted at one or two data points only. All recovered and were within limits prior to and/or after the 2-week drying period.

The average value change for the Mylar capacitor lots is plotted in figure 19. The data summaries are given in table B-6 of appendix B for the field and control groups. The control lot percentage change correlated with the relative humidity of the environment; i.e., the percent change increases during the summer months and approaches zero during the winter months. The relative humidity is not controlled by the Melpar laboratory

E5714


ELAPSED TI
23 84 90
120
150
180
210
240
270
300
330
4
3
2
1
0
-1
Failure Limits: Cap= ± 6%
DF= 125%
Δc %
JCT
SCT
SECT
JECT
CCT
March
June
July
August
September
October
November
December
January
Februa
RAINY SEASON
1964
DRY SEASON
EXPOS
Days)
360
390
420
450
480
510
540
570
600
630
JCT
SECT
JECT
SCT
CCT
March
April
May
June
July
August
September
October
November
December
TIME (Months)
RAINY SEASON
1965

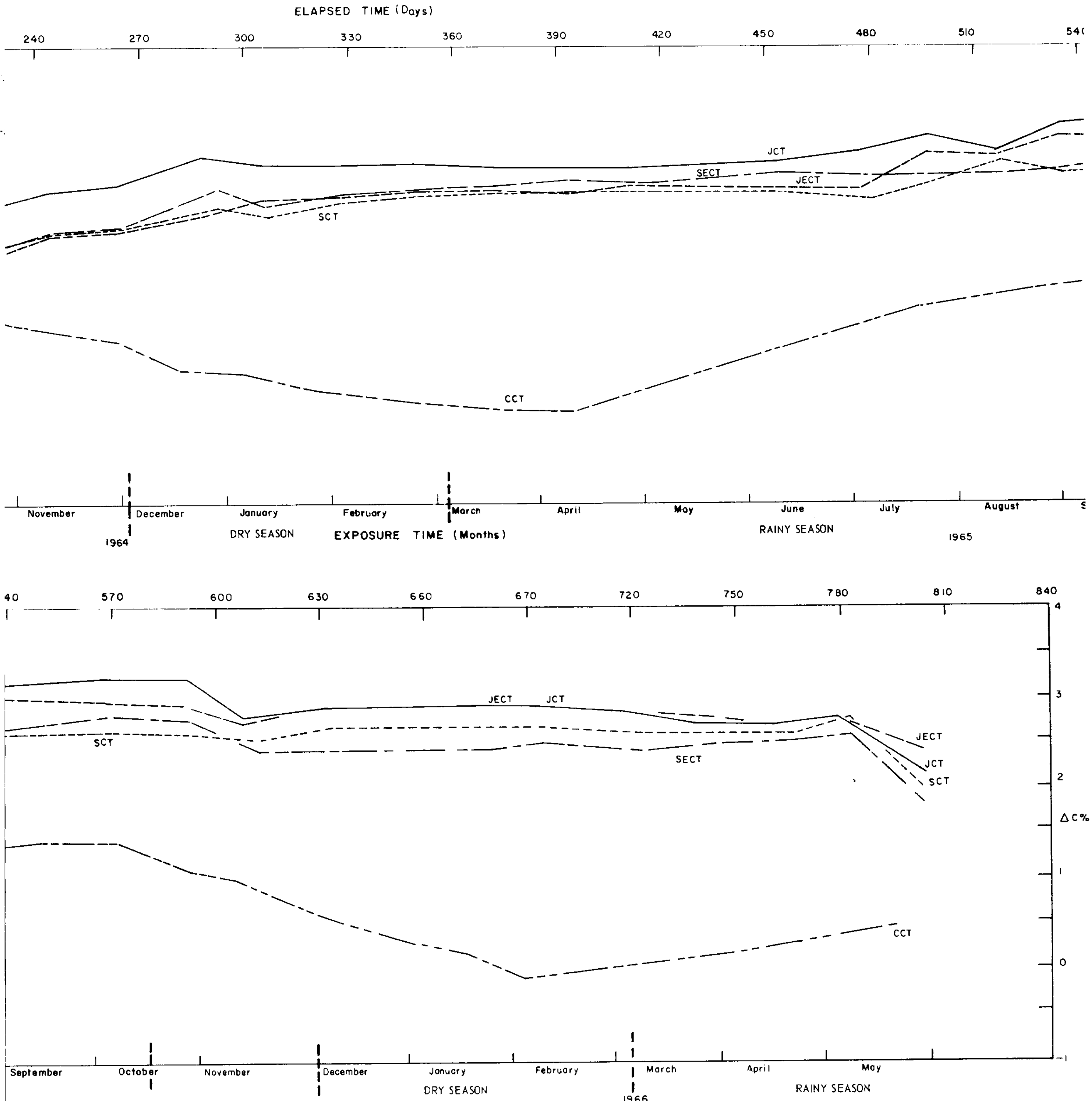



Figure 19. Life Test Group CT



2

air-conditioning system. Therefore, when dry, cold air is heated, the resulting relative humidity is very low; e.g., 20 percent. During the summer, the relative humidity is high because the hot, humid air is cooled to only a few degrees below the desired room ambient before circulation, resulting in relative humidities of 60 to 70 percent. The data for the control reflect this change in relative humidity. The capacitance value of tropic lots have all increased with time and appear to have become stable, reflecting the year-round high relative humidity of the environment. This condition was changed by the 2-week drying process. The decreased relative humidity resulted in an average capacitance decrease of over one-half percent.

The effect of the drying process is reflected in average capacitance percentage degree in figure 20 and summarized in table C-6 of appendix C.

The measured dissipation factor for the tropical lots appears to increase in the periods generally defined as the rainy season with a secondary effect from the airborne salt spray. These components responded to the board and component washing except that the data block just prior to the 2-week dryout had unconfirmed failures totaling seven, and one component without valid data for the two shore-located lots. These data were taken after the prescribed board washing. All eight of these components recovered during the drying period.

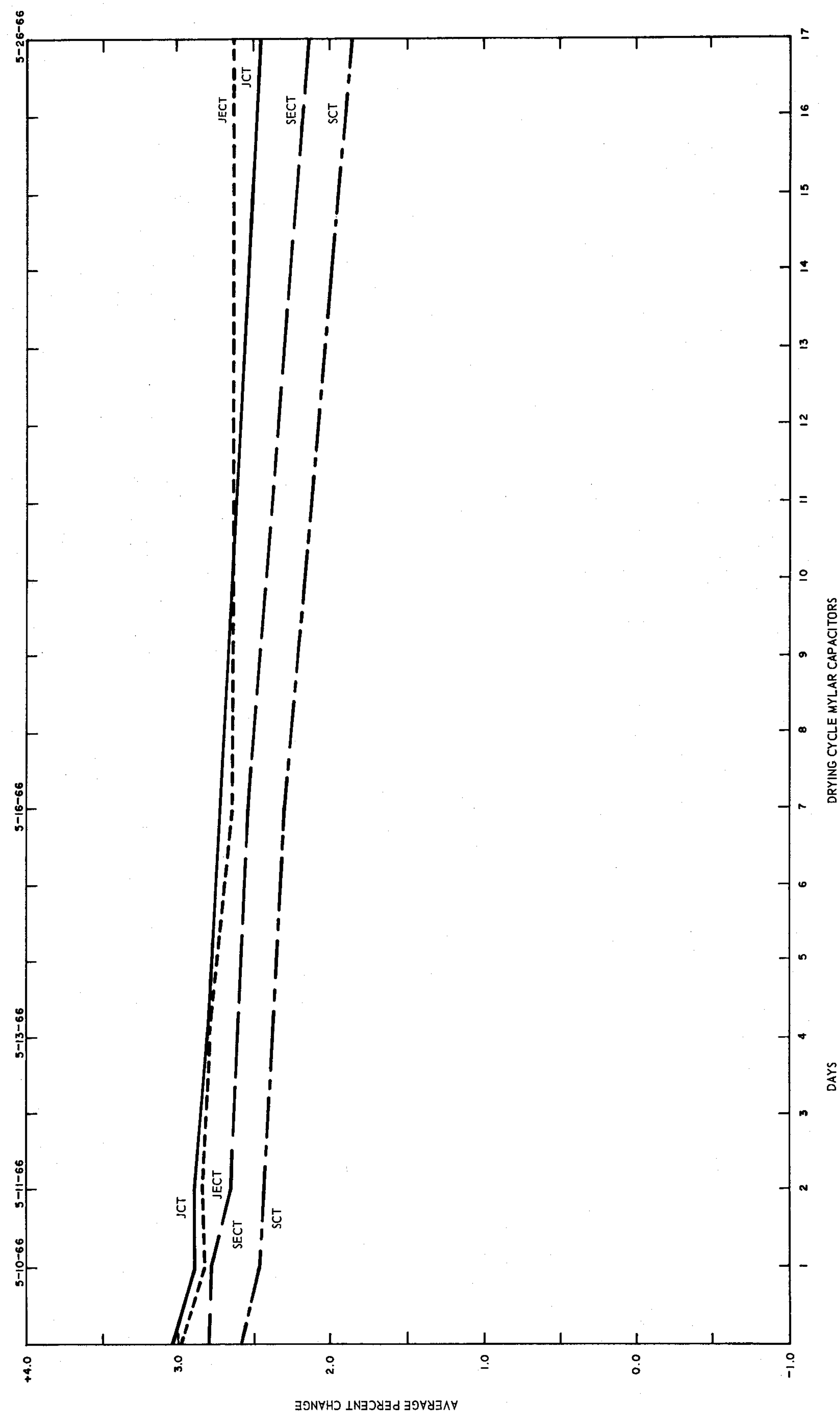



Figure 20. Drying Cycle, Mylar Capacitors (Group CT)

## 2.11 Capacitor, Fixed, Mica, CM

The CM-06 capacitors were inspected for visual indications of degradation caused by 23 months of tropical exposure. The summaries are:

JCM - No visible evidence of degradation.

JECM - No visible evidence of degradation.

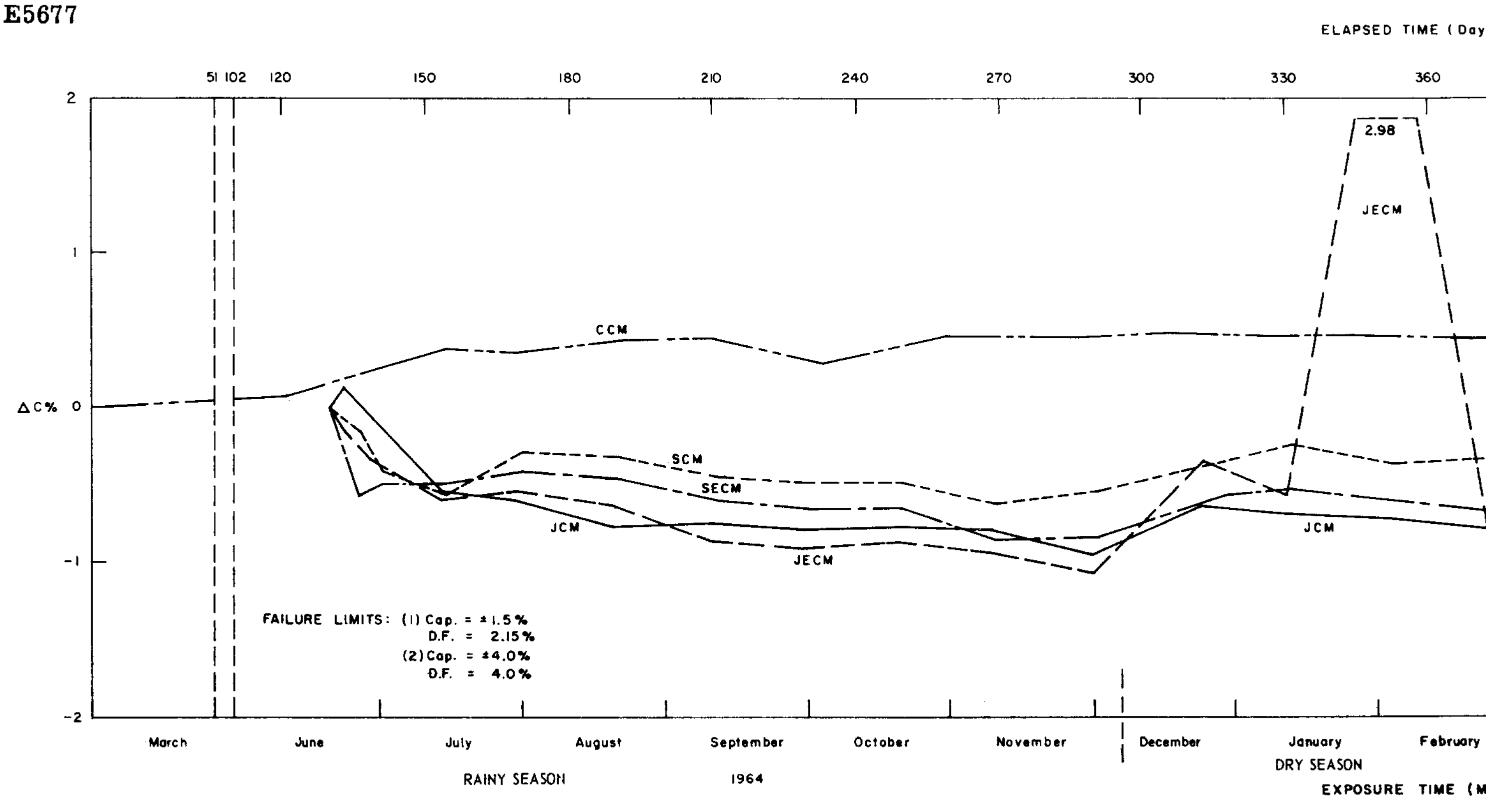
SCM - Evidence of solder (tin or lead) migration, no corrosion at lead-body interface, general corrosion of leads.

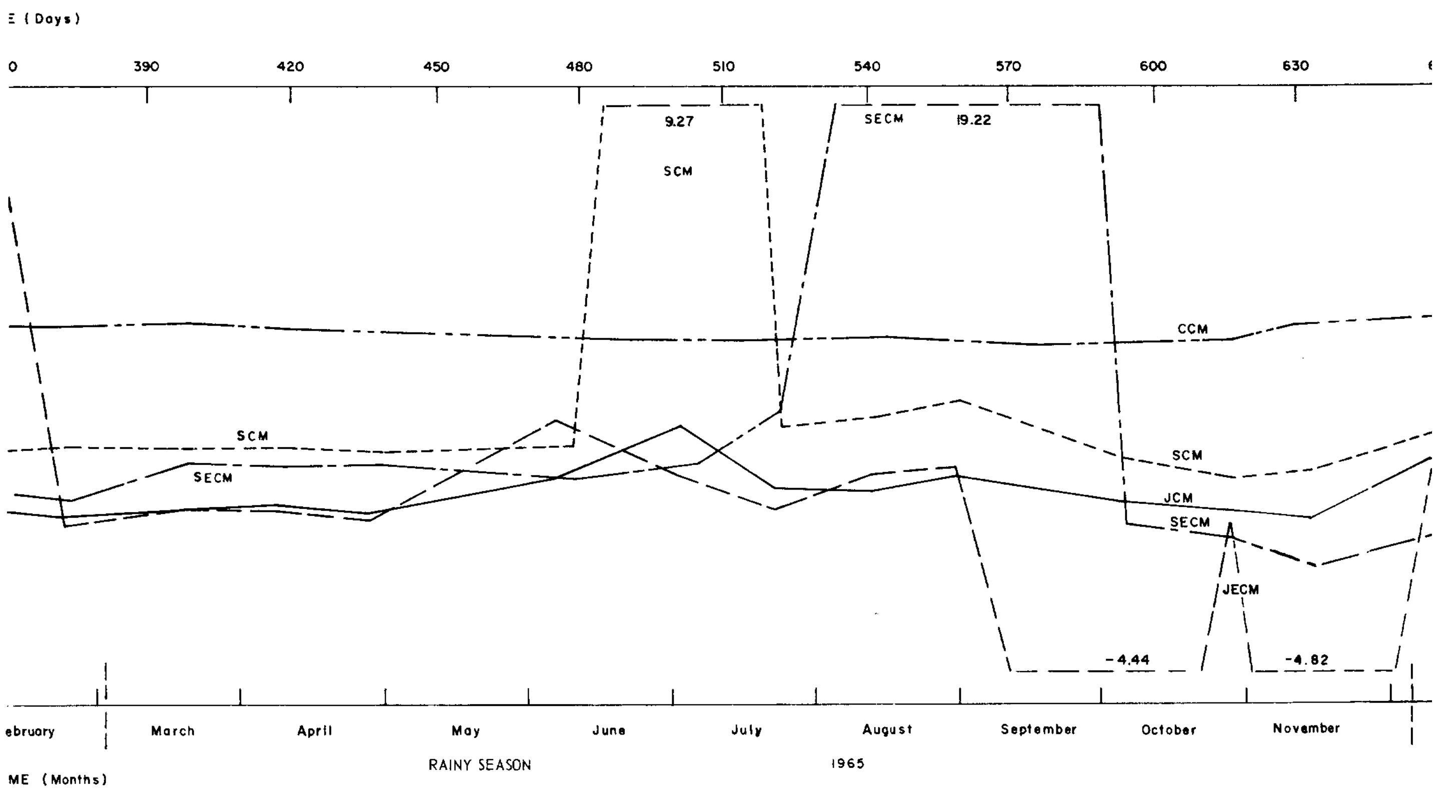
SECM - Same as SCM above.

### Data Analysis

The results of 23 months of tropical exposure for the type CM-06 capacitors as reflected in the average percentage change in capacitance value for each group are graphically presented in figure 21 and summarized in table B-7 of appendix B. The data were processed with the change in capacitance limit set at 1.5 percent for D degredation and 3.0 percent for C degradation. These limits are rather restrictive, but mica capacitors are normally considered in the same precision category as the RN film resistors. Correspondingly the dissipation factor limits were set at 2.15 percent for D and 4.3 percent for C degradation.

A review of the data for the 100 mica capacitors on exposure in the tropics provides an indication of the relative levels for the four groups. The following is a summary of number of components in each group which, during the 23 months of exposure, have been reported in either of the two levels of degradation.


ELAPSED TIME ( Day
51 102 120 150 180 210 240 270 300 330 360
2
1
0
-1
-2
ΔC%
2.98
JECM
CCM
SCM
SECM
JCM
JECM
JCM
FAILURE LIMITS: (1) Cap. = ±1.5%
D.F. = 2.15%
(2) Cap. = ±4.0%
D.F. = 4.0%
March
June
July
August
September
October
November
December
January
February
RAINY SEASON
1964
DRY SEASON
EXPOSURE TIME (M


E ( Days )
0 390 420 450 480 510 540 570 600 630 6
9.27
SCM
SECM
19.22
CCM
SCM
SECM
SCM
JCM
SECM
JECM
-4.44
-4.82
ebruary
March
April
May
June
July
August
September
October
November
RAINY SEASON
1965
ME (Months)

1

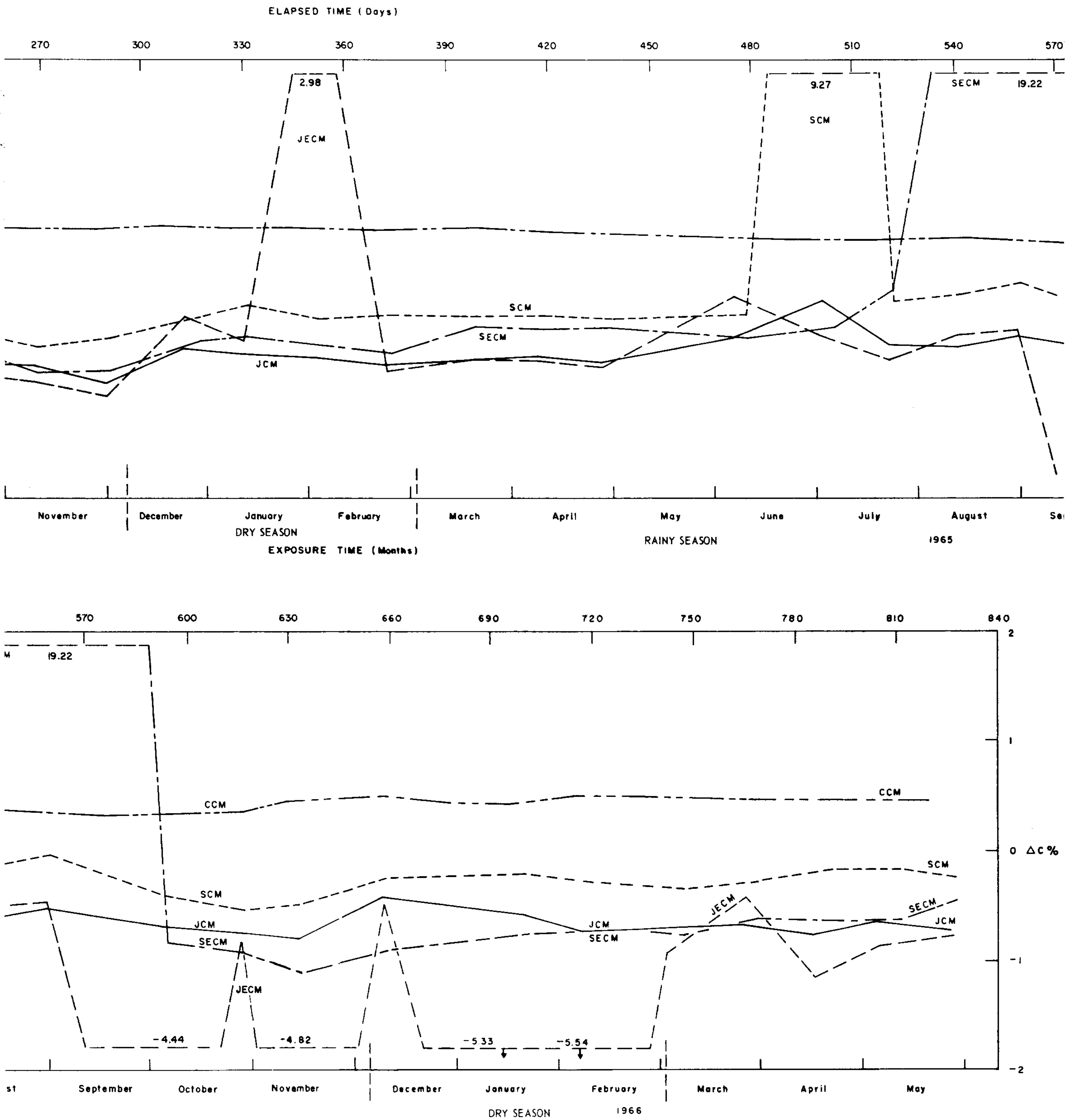



Figure 21. Life Test Group CM

| Test group | "D" degradation (Number of components reported) | "C" degradation (Number of components reported) |
|---|---|---|
| JCM | 8 | 2 |
| JECM | 7 | 9 |
| SCM | 16 | 16 |
| SECM | 24 | 23 |

The majority of these reported degradations occurred during the fall wet season with recovery during the winter-spring dry season. It is noted that the average values for all four groups were within the "D" limit during the months of March, April, and May during the dry season and after the terminal board decontamination procedure had been instituted.

The recovery during the 2-week drying cycle was not drastic (see figure 22) as evidenced by change in capacitance. The dissipation factor was recorded as decreasing by small increments such as 0.2 percent. See table C-7 in appendix C.

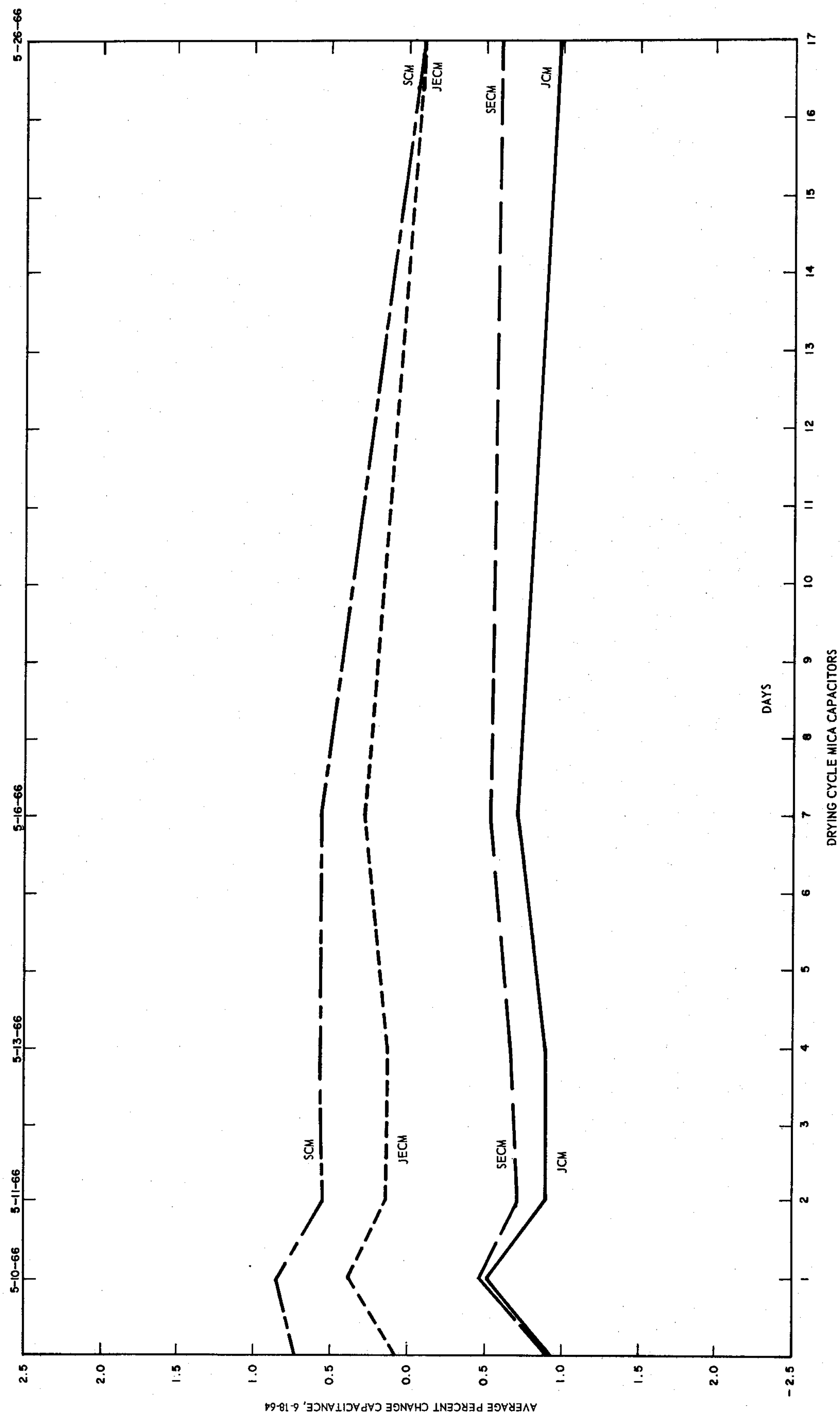



Figure 22. Drying Cycle, Mica Capacitors (Group CM)

## 2.12 Inductor, Fixed, WE

The fixed ferrite-core inductors were inspected for visible evidence of degradation after 23 months of tropical exposure. The results are summarized here:

JWE - Faint lead discoloration.

JEWE - Faint lead discoloration.

SEW - Lead corrosion (rough texture) with indications of migration of solder across both ends of units.

SEWE - Lead corrosion (rough texture) with indications of migration of solder across both ends of units.

### Data Analysis

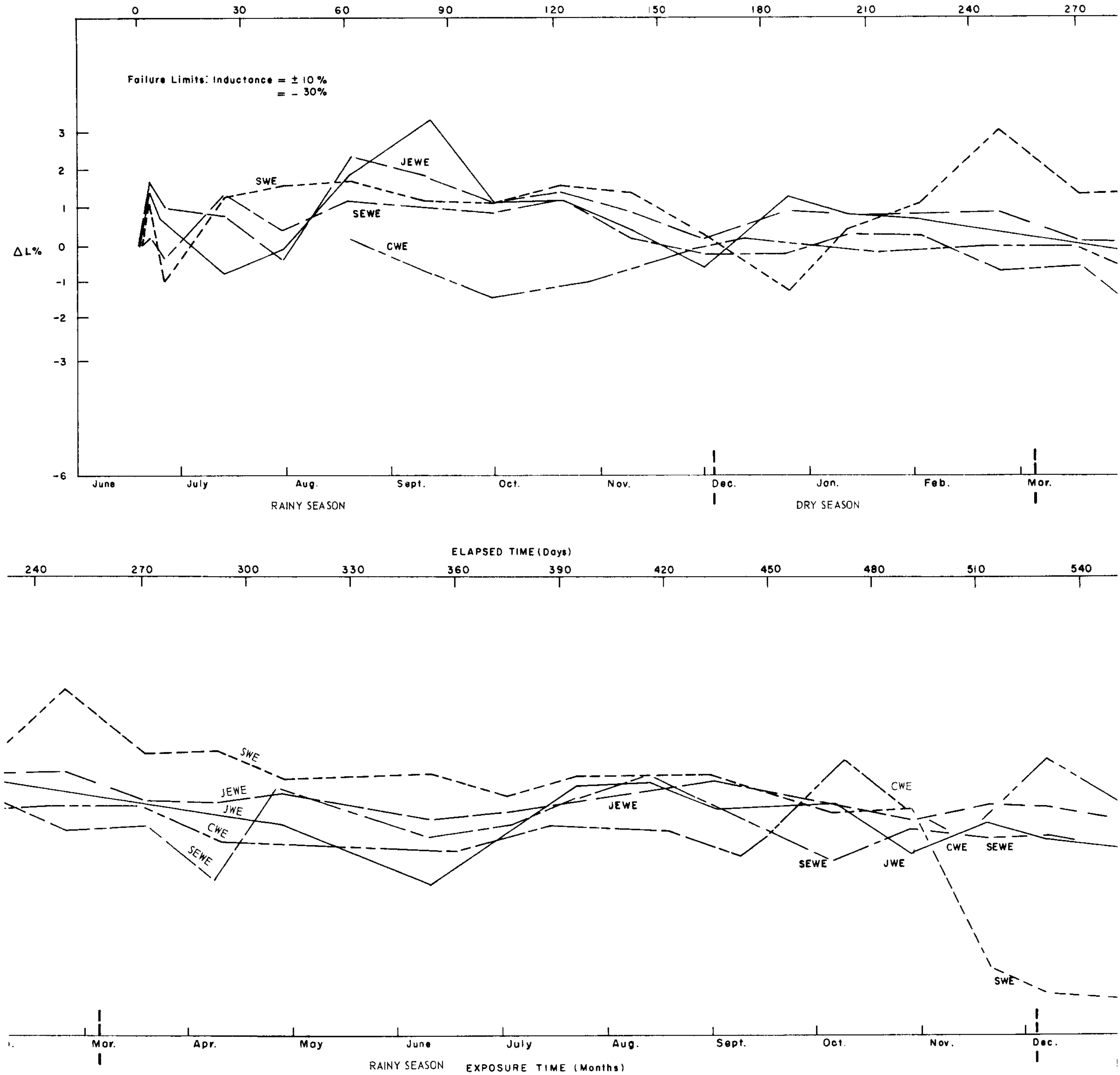
The WE inductors have withstood the stress of 23 months of tropical exposure without the development of a degradation pattern or trend which could be used to identify a possible failure mechanism. No catastrophic failures have been recorded.

Figures 23 and 24 are the graphic presentations of the changes in capacitance Q and for all component lots for the 23 months of exposure.

The effect of the drying cycle on each group is similar. The recovery of inductance and Q are shown in figures 25 and 26, respectively.

The data summaries for all field and control component groups are given in tables B-8 and B-9 of appendix B.

The data summaries for the selected components of the drying cycle are given in tables C-8 and C-9 of appendix C.


0
30
60
90
120
150
180
210
240
270
Failure Limits: Inductance = ± 10 %
= – 30%
3
2
1
0
-1
-2
-3
-6
ΔL%
JEWE
SWE
SEWE
CWE
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
RAINY SEASON
DRY SEASON
ELAPSED TIME (Days)
240
270
300
330
360
390
420
450
480
510
540
SWE
JEWE
JWE
CWE
SEWE
JEWE
CWE
SEWE
JWE
CWE
SEWE
SWE
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
RAINY SEASON
EXPOSURE TIME (Months)

F

1

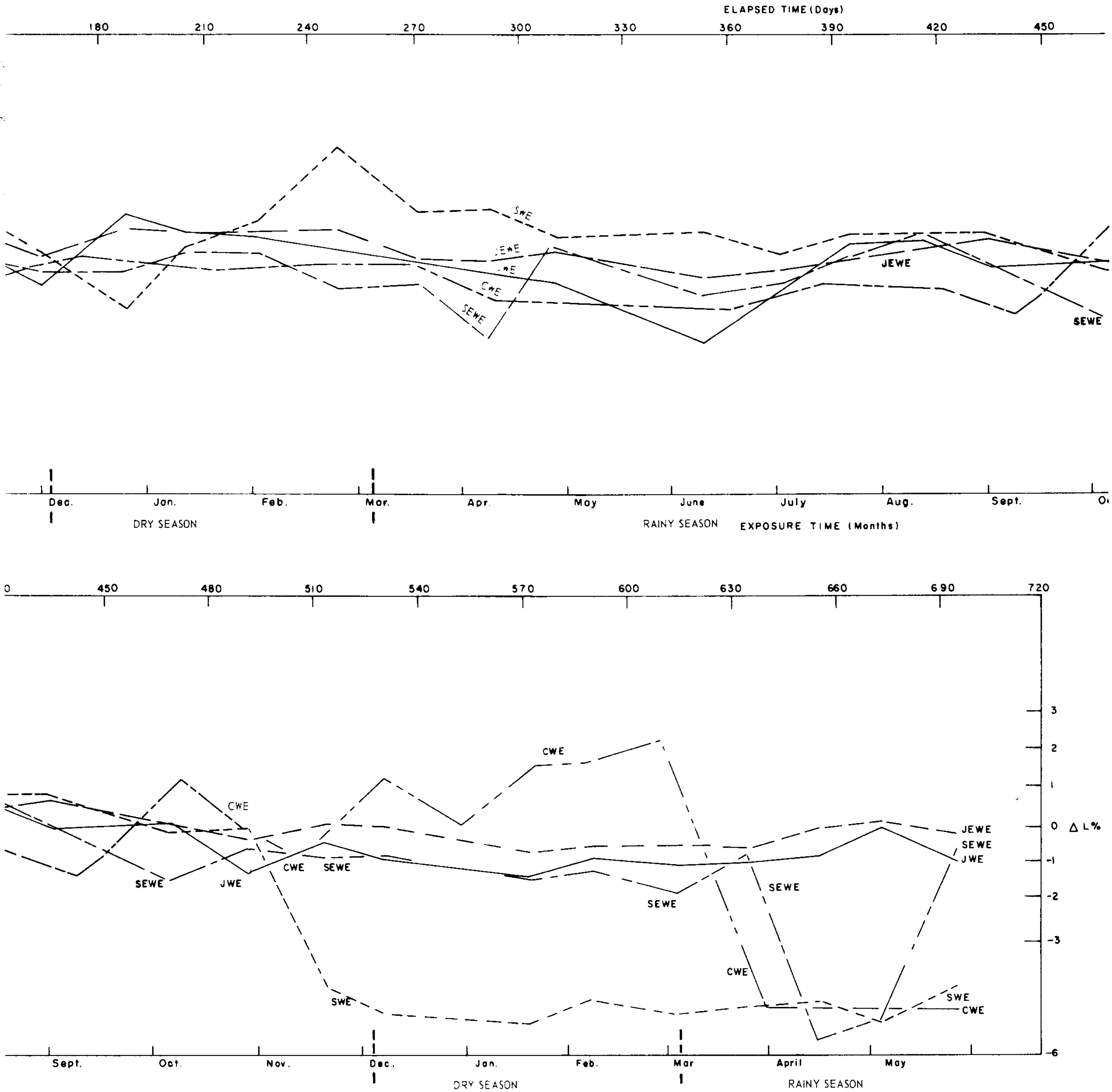
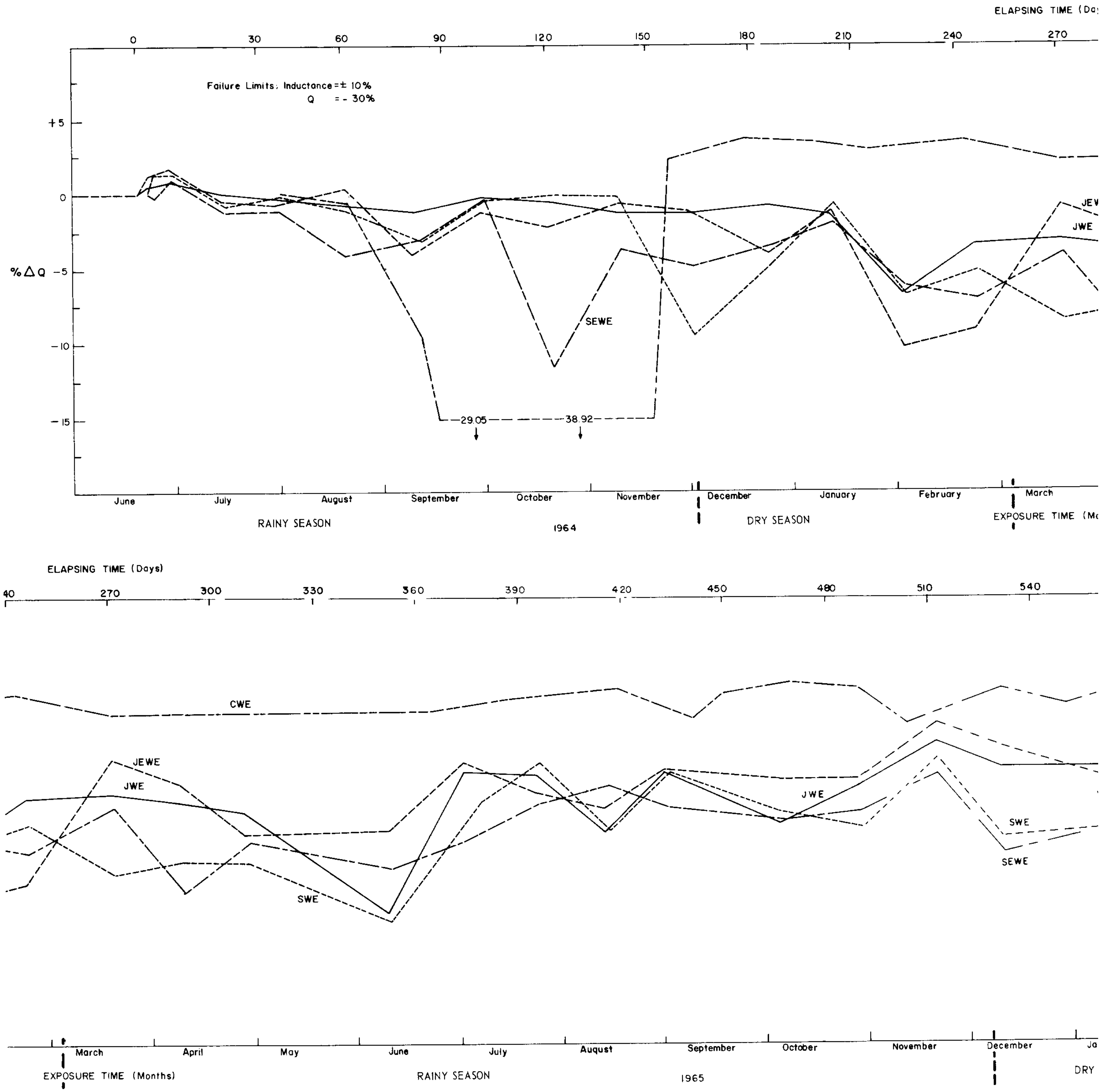



Figure 23. Life Test Group WE (% ΔL)



2


ELAPSING TIME (Da
0
30
60
90
120
150
180
210
240
270
Failure Limits; Inductance = ± 10%
Q = - 30%
+5
0
%ΔQ -5
-10
-15
SEWE
JEW
JWE
29.05
38.92
June
July
August
September
October
November
December
January
February
March
RAINY SEASON
1964
DRY SEASON
EXPOSURE TIME (Mo
ELAPSING TIME (Days)
40
270
300
330
360
390
420
450
480
510
540
CWE
JEWE
JWE
SWE
JWE
SWE
SEWE
March
April
May
June
July
August
September
October
November
December
Ja
EXPOSURE TIME (Months)
RAINY SEASON
1965
DRY

Figu

1

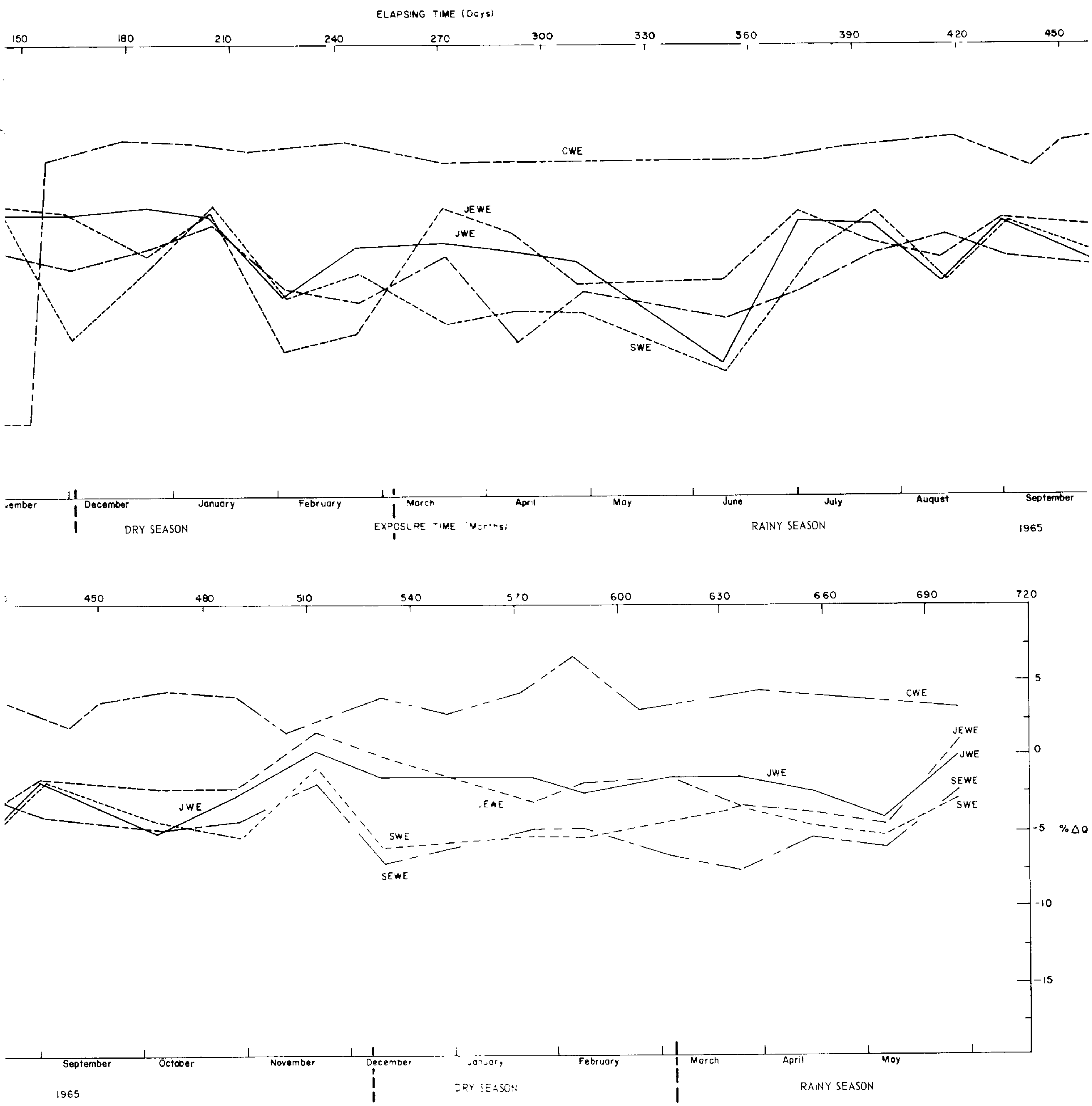



Figure 24. Life Test Group WE (% ΔQ)

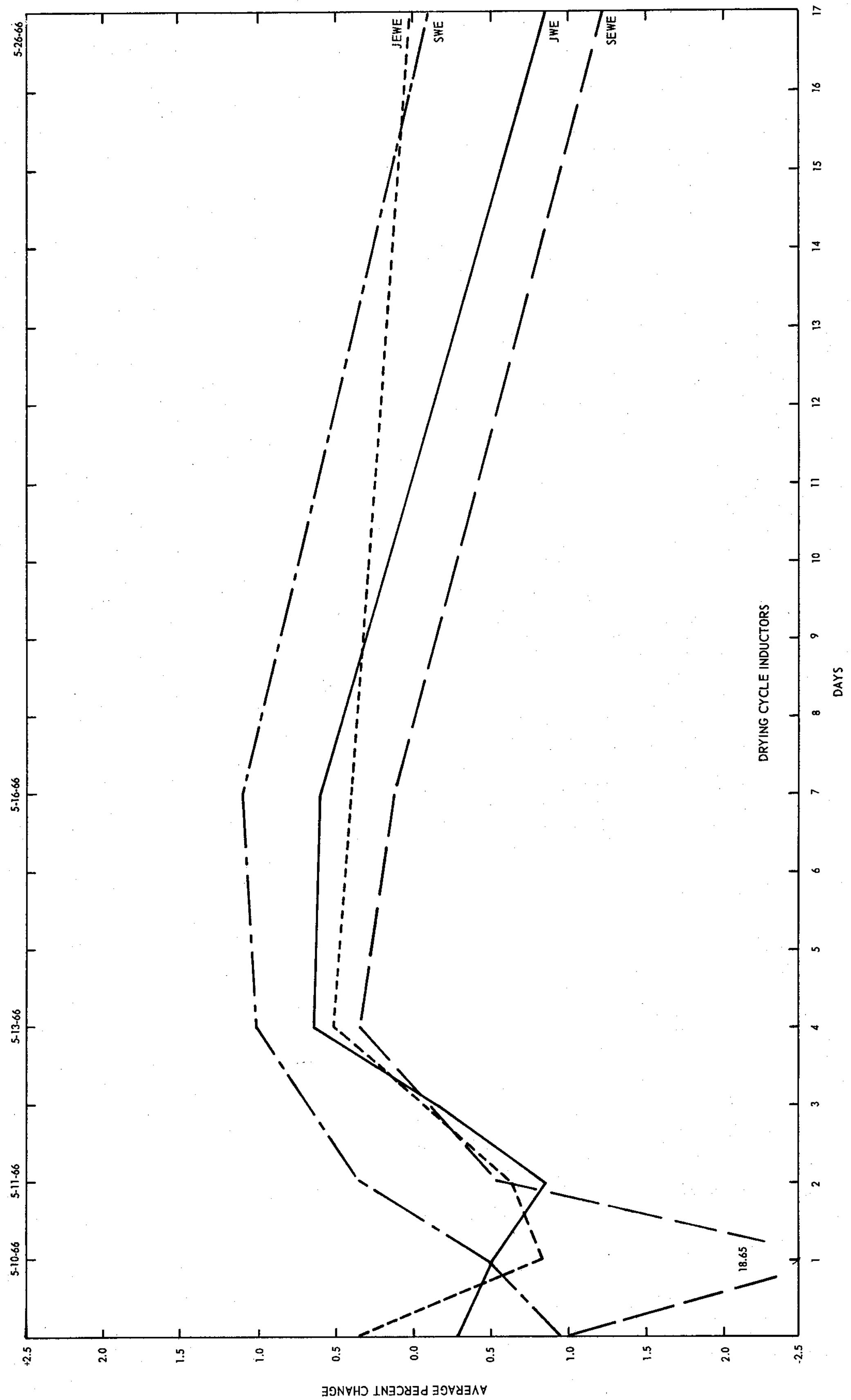
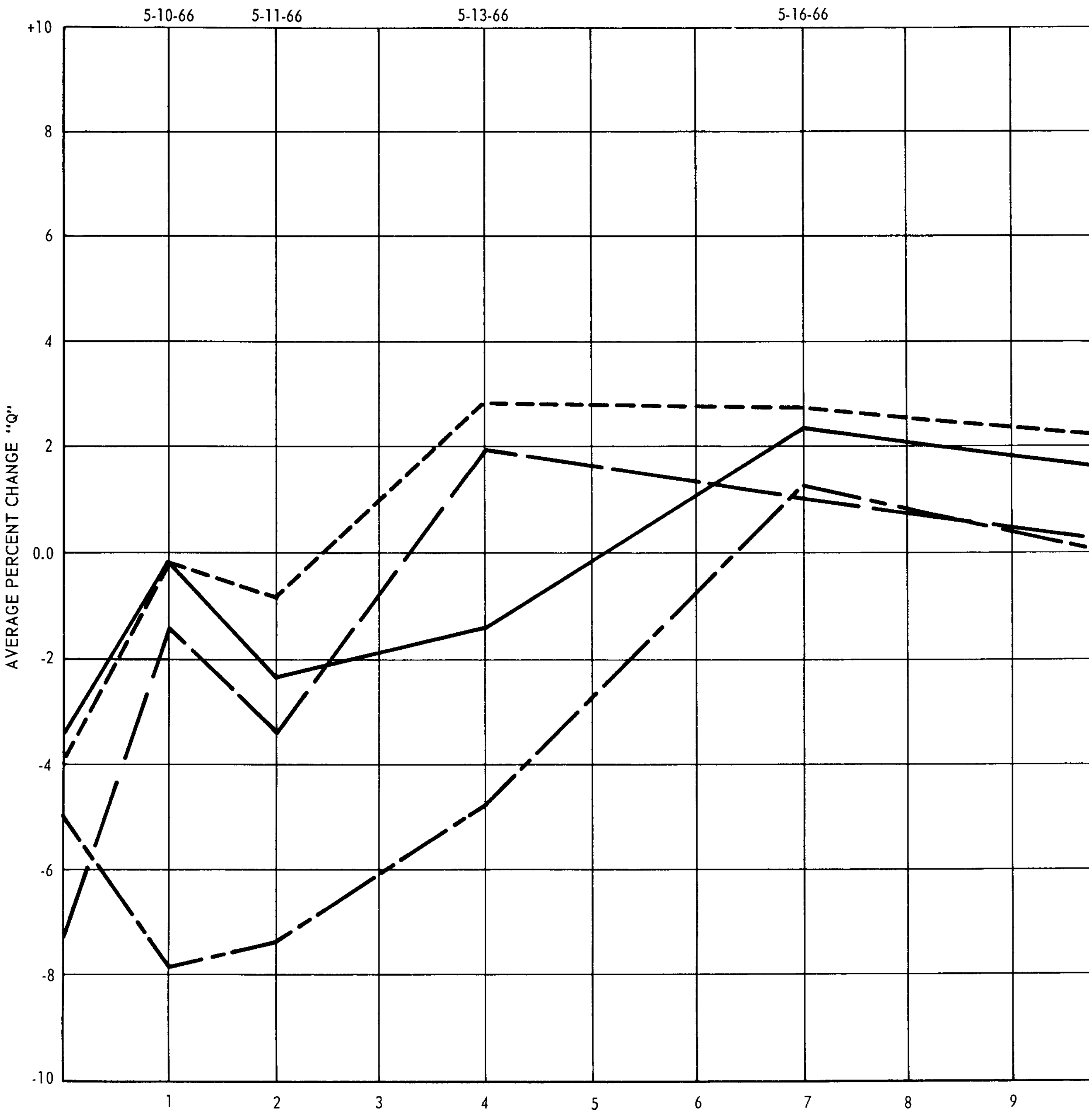



Figure 25. Drying Cycle Inductors, WE, Inductive

E6493


5-10-66
5-11-66
5-13-66
5-16-66
+10
8
6
4
2
0.0
-2
-4
-6
-8
-10
AVERAGE PERCENT CHANGE "Q"
1
2
3
4
5
6
7
8
9

①

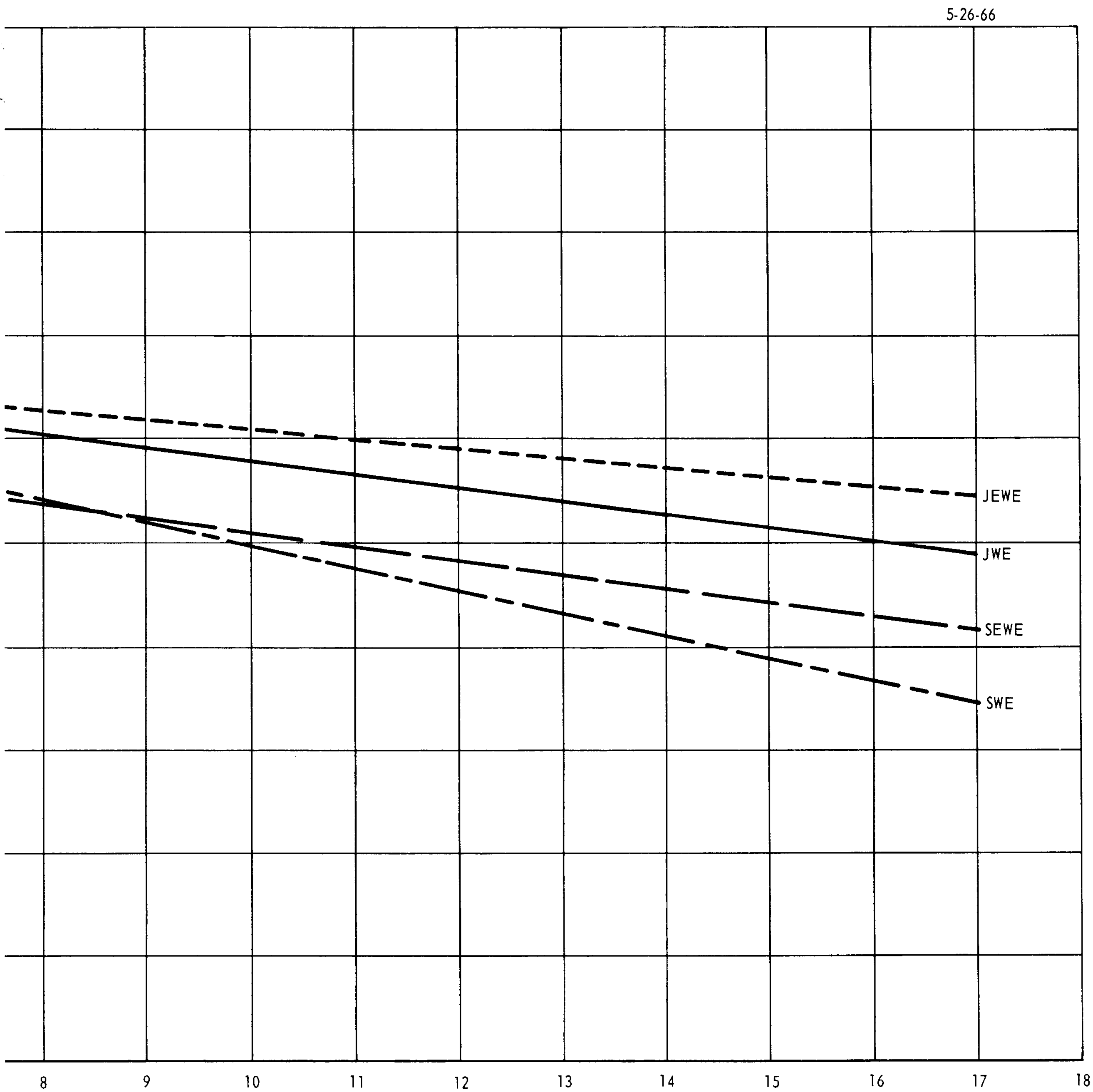



Figure 26. Drying Cycle Inductors, Q

In order to facilitate data taking, the WE components have been measured at 1000 Hz on a universal bridge. This method does not appear to be sensitive enough to respond to changes in Q at such higher frequencies as 1.5 to 2.0 MHz. A comparison could be made between the laboratory control lot and the tropic field lots before the tropic lots are finally removed from exposure to provide an indication of degradation at radio frequencies.

2.13 Microminiature Module Capacitor, MC

Data found for the microminiature module capacitors, MC, are omitted because the test specimens were inherently defective before the study was started, and furthermore, they do not qualify for military applications.

## 2.14 Microminiature Module Resistor, MR

Data found for the microminiature module resistors, MR, are omitted because the test specimens were inherently defective before this study was started, and furthermore, they do not qualify for military applications.

## 2.15 Wire, Cable and Connectors

### Summary

The exposure of the selected wire, cable, and connector specimens during the past year has yielded information indicative of their ability to withstand tropical environments. The silver-plated coaxial radio-frequency connectors continued to corrode in the shore atmosphere, whereas the U-219()/U aluminum 26-pair connector treated with MIL-14072 Finish No. E-561 (Alumilite 225 or equal) hard coat exhibited no functional deterioration and the special jungle single pair telephone field wire was attacked by animals in a manner essentially the same as in September 1964 and caused electrical discontinuities.

The data summaries for the exposed wires and cables are given in table 2. The data taken for attenuation at radio frequencies is given in table 3.

### Silver-Plated Coaxial Connectors

The connectors located at the jungle site exhibited only slight tarnish which corresponds to that observed when these components are in a non-sulphur atmosphere. The connectors located at the shore site have, during the past year, continued to corrode. The extent of this action has been sufficient to require pliers to remove the protective caps and plugs from the BNC connectors. The inside of these connectors exhibited silver tarnish and slight corrosion products on or adjacent to the gold-plated contacts. The extent of the external corrosion can be seen in the two photographs of these connectors in figures 27 and 28.

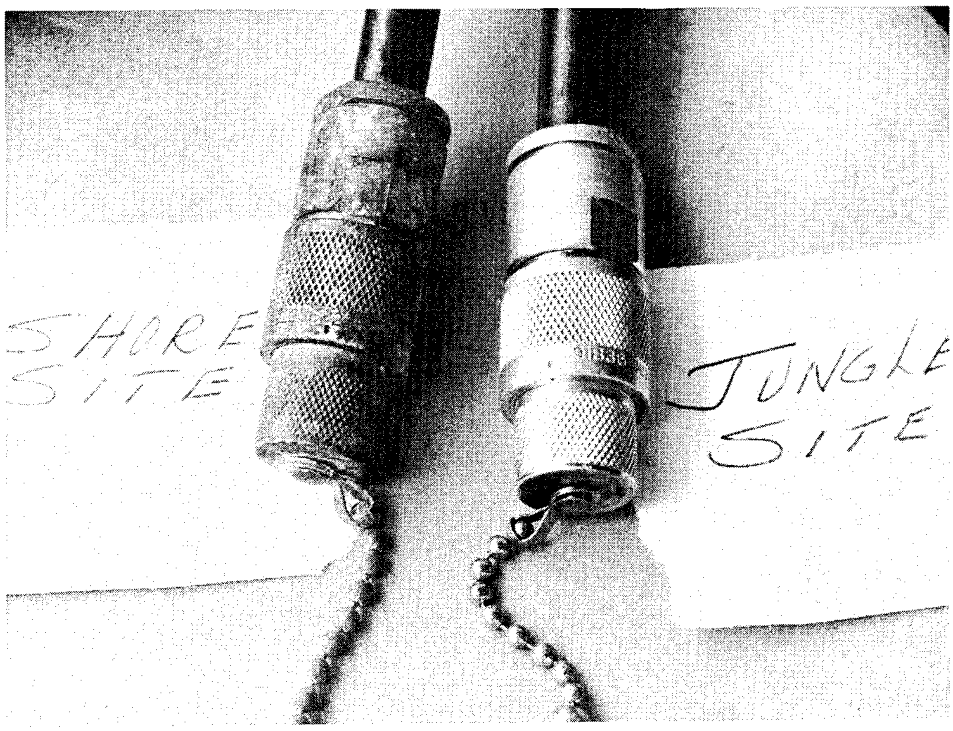



Figure 27. Tropical Exposure, Silver-Plated Connector

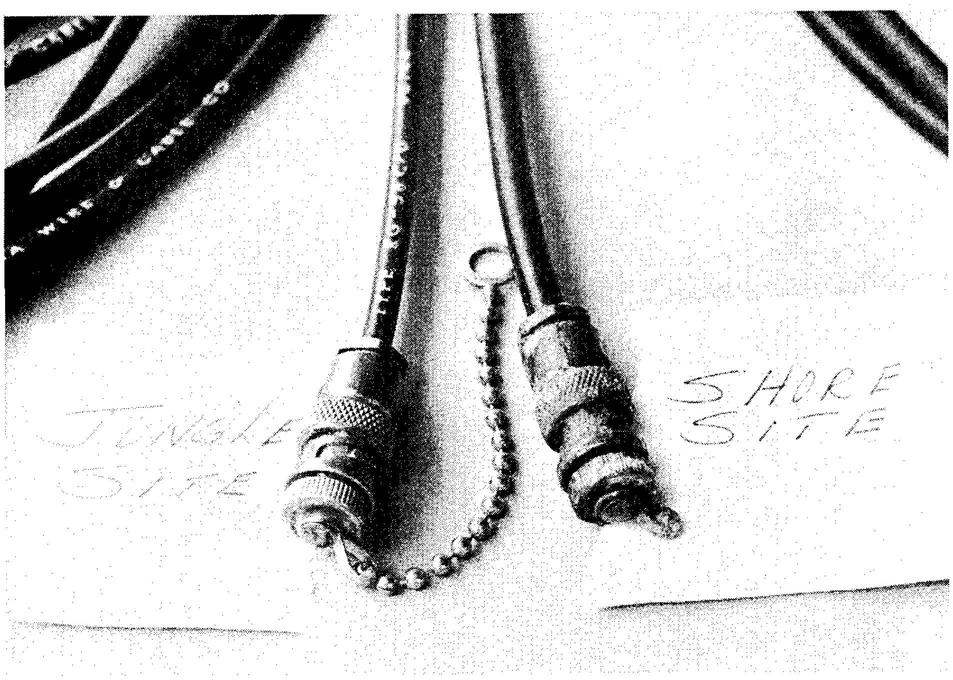



Figure 28. Tropical Exposure, Silver-Plated Connector

# TABLE 2. FIELD WIRE DATA SUMMARY

FIELD WIRE DATA SUMMARY

| SAMPLE/DATE | 7-8-65 | | | 8-2-65 | | | 11-2-65 | | | 1-12-66 | | | 4-11-66 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RsΩ | IR-MΩ | T/RH% | RsΩ | IR-MΩ | T/RH% | RsΩ | IR-MΩ | T/RH% | RsΩ | IR-MΩ | T/RH% | RsΩ | IR-MΩ | T/RH% |
| JUNGLE PAYED OUT | | | | | | | | | | | | | | | |
| JWD-1 | 120 | | 82/92 | 120 | | 72/97 | 120 | | 76/98 | 120 | | 86/72 | 125 | | 90/50 |
| WIRE-WIRE | | >10 | | | >10 | | | >10 | | | >10 | | | >10 | |
| WIRE-GROUND | | >1 | | | >1 | | | >1 | | | >10 | | | >10 | |
| JWD-1 MOD. | 160 | | 82/92 | 150 | | 72/97 | 150 | | 76/98 | 160 | | 86/72 | 170 | | 90/50 |
| WIRE-WIRE | | >10 | | | >10 | | | >10 | | | >10 | | | >10 | |
| WIRE-GROUND | | 10 | | | >10 | | | 10 | | | >1 | | | >1 | |
| JWF-16 | | | | | | | | | 76/98 | | | 86/72 | | | |
| WHITE-WHITE | 140 | >10 | 82/92 | 140 | >10 | 72/97 | 140 | >10 | | 120 | >10 | | OPEN CIRCUIT, CAUSE NOT DETERMINED. | | |
| BLACK-BLACK | 140 | >10 | | 140 | >10 | | 140 | >10 | | 120 | >10 | | | | |
| WHITE-BLACK | | >10 | | | 10 | | | 10 | | | 10 | | | | |
| WIRE-GROUND | | >10 | | | 10 | | | >10 | | | >1 | | | | |
| JUNGLE STORAGE | | | | | | | | | | | | | | | |
| JWD-1 | | >10 | 82/90 | NO DATA TAKEN | | | | >10 | 76/98 | | >10 | 86/72 | | >10 | 90/50 |
| JWD-1-MOD. | | >10 | 82/90 | NO DATA TAKEN | | | | >10 | 76/98 | | >10 | 86/72 | | 100 | 90/50 |
| JWF-16 BLACK-BLACK | | >10 | 82/90 | NO DATA TAKEN | | | | >10 | 76/98 | | 100 | 86/72 | | >100 | |
| WHITE-WHITE | | >10 | | | | | | >10 | | | 100 | | | 100 | |
| BLACK-WHITE | | >10 | | | | | | >10 | | | >10 | | | >10 | |
| SHORE PAYED OUT | | | | | | | 10-7-65 | | | | | | | | |
| SWD-1 | 220 | | 84/84 | NO DATA TAKEN | | | 220 | | 97/76 | 220 | | 87/67 | 220 | | 89/52 |
| WIRE-WIRE | | >10 | | | | | | <10 | | | 10 | | | 10 | |
| WIRE-GROUND | | >1 | | | | | | >1 | | | >1 | | | >1 | |
| SWD-1 MOD. | 220 | | 84/84 | NO DATA TAKEN | | | 220 | | 87/76 | 225 | | 87/67 | 220 | | 89/52 |
| WIRE-WIRE | | >1 | | | | | | >1 | | | 1 | | | >1 | |
| WIRE-GROUND | | <1 | | | | | | <1 | | | <1 | | | 1 | |
| SWF-16 | | | | | | | | | | | | 87/67 | | | |
| WHITE-WHITE | 240 | >10 | 84/84 | NO DATA TAKEN | | | 250 | >10 | 87/76 | 260 | >10 | | 280 | 10 | 89/52 |
| BLACK-BLACK | 240 | >10 | | | | | 250 | >10 | | 260 | >10 | | 270 | >10 | |
| WHITE-BLACK | | >1 | | | | | | >1 | | | 10 | | | >1 | |
| WIRE-GROUND | | 1 | | | | | | <1 | | | <1 | | | >1 | |
| SHORE STORAGE | | | | | | | | | | | | | | | |
| SWD-1 | | 10 | 84/82 | NO DATA TAKEN | | | | <10 | 87/76 | | >1 | 87/67 | | 1 | 89/52 |
| SWD-1 MOD. | | >1 | 84/82 | | | | | <1 | 87/76 | | >10 | 87/67 | | 1 | 89/52 |
| SWF-16 BLACK-BLACK | | >1 | 84/82 | | | | | 10 | 87/76 | | 1 | | | 1 | 89/52 |
| WHITE-WHITE | | 1 | | | | | | <10 | | | <10 | | | >1 | |
| BLACK-WHITE | | 1 | | | | | | >1 | | | 1 | | | <1 | |

| SAMPLE/DATE | 1-12-66 | | | 4-11-66 | | |
|---|---|---|---|---|---|---|
| | RsΩ | IR-MΩ | T/RH% | RsΩ | IR-MΩ | T/RH% |
| JUNGLE TEST SITE | | | | | | |
| WM-130 MULTI. CONDUCT. WITH CONNECTORS | | | | | | |
| PIN-PIN | | $>10^3$ | 86/72 | | $10^3$ | 87/60 |
| PIN-PIN | | $>10^3$ | | | $10^3$ | |
| PIN-PIN | | $>10^3$ | | | $10^3$ | |
| PIN-PIN | | $>10^3$ | | | $10^3$ | |
| PIN-PIN | | $>10^3$ | | | $10^3$ | |
| FOIL-GROUND | | $>10^2$ | | | $>10^2$ | |
| JUNGLE PAYED OUT | | | | | | |
| AWG 23 | 250 | | 85/75 | OPEN CIRCUIT 87/60 WIRE & INSULATION GNAWED BY WILDLIFE. | | |
| WIRE-WIRE | | 1 | | | | |
| WIRE-GROUND | | 1 | | | | |
| RCA-CABLE-012<br>RCA-CABLE-013 | VISUAL & MECH. ONLY<br>GOOD CONDITION 85/75 | | | GOOD CONDITION 88/58 | | |
| WM-130 WITHOUT CONNECTORS | VISUAL & MECHANICAL<br>GOOD CONDITION 85/75 | | | GOOD CONDITION 88/58 | | |
| HOOK UP WIRE (ELEC.) | NO DATA TAKEN | | | GOOD CONDITION 88/58 | | |
| SHORE TEST SITE | | | | | | |
| WM-130 MULTI. CONDUCT WITH CONNECTORS | | | | | | |
| PIN-PIN | | $>10^2$ | 86/70 | | $10^3$ | 90/50 |
| PIN-PIN | | $>10^2$ | | | $10^3$ | |
| PIN-PIN | | $>10^2$ | | | $10^3$ | |
| PIN-PIN | | $>10^2$ | | | $10^3$ | |
| PIN-PIN | | $>10^2$ | | | $10^3$ | |
| FOIL-GROUND | | >10 | | | $>10^2$ | |
| SHORE PAYED OUT | | | | | | |
| AWG-23 | 250 | | 86/70 | 250 | | |
| WIRE-WIRE | | >10 | | | >10 | |
| WIRE-GROUND | | >10 | | | 10 | |
| RCA-CABLE-012<br>RCA-CABLE-012 | VISUAL & MECH. ONLY<br>GOOD CONDITION | | | GOOD CONDITION | | |
| WM-130 WITHOUT CONNECTORS | VISUAL & MECH. ONLY<br>GOOD CONDITION | | | GOOD CONDITION | | |
| HOOK UP WIRE (ELEC.) | NO DATA TAKEN | | | GOOD CONDITION | | |

KEY: RsΩ = WIRE CONTINUITY CHECK, RESISTANCE (OHMS).
IR-MΩ = INSULATION RESISTANCE—MEGOHMS.
T/RH% = TEMPERATURE °F/RELATIVE HUMIDITY %.

NOTE: DATA TAKEN FOR THE JUNGLE PAYED-OUT WIRE ON 8-2-65 AND FOR THE SHORE PAYED-OUT WIRE ON 11-2-65 WERE EXTRA READINGS NOT INCLUDED IN THE 3-MONTH READING CYCLE. THESE READINGS WERE TAKEN IMMEDIATELY PRIOR TO THE CUTTING OF 50-FOOT TEST SAMPLES TO BE SHIPPED BACK TO MELPAR, AND SUBSEQUENT FORWARDING TO FORT MONMOUTH.

TABLE 3

COAXIAL CABLE ATTENUATION DATA (DB) 100 FT

| Sample No. | 1 GHz | 1.5 GHz | 2 GHz | 3 GHz | 4 GHz |
|---|---|---|---|---|---|
| JRG-58-1 | 21.6 | 31.6 | 49.0 | 47.3 | 56.6 |
| JRG-58-2 | 21.6 | 29.3 | 35.0 | 44.3 | 53.3 |
| SRG-58-1 | 23.3 | 30.0 | 36.6 | 50.0 | 63.3 |
| SRG-58-2 | 29.3 | 33.3 | 43.0 | 63.3 | 66.6 |
| JRG-330-1 | 17.0 | 21.6 | 29.6 | 35.3 | 41.6 |
| JRG-330-2 | 17.5 | 26.3 | 29.3 | 37.3 | 48.3 |
| SRG-330-1 | 27.0 | 29.6 | 36.6 | 43.3 | 56.6 |
| SRG-330-2 | 21.6 | 23.3 | 36.0 | 36.6 | 58.3 |
| Test Date 9-29-65: | Laboratory Environment 77°F/50% RH 30-ft lengths | | | | |
| JRG-58-1 | | | 44.6 | 44.6 | 53.9 |
| JRG-58-2 | | | 35.0 | 43.2 | 51.9 |
| SRG-58-1 | | | 36.6 | 47.2 | 60.0 |
| SRG-58-2 | NO | | 55.2 | 61.2 | 66.6 |
| JRG-330-1 | DATA | | 29.6 | 33.9 | 40.0 |
| JRG-330-2 | TAKEN | | 27.3 | 36.6 | 46.2 |
| SRG-330-1 | | | 37.9 | 41.9 | 55.2 |
| SRG-330-2 | | | 32.6 | 36.6 | 55.9 |
| Test Date 1-5-66 | | | 86°F/79% RH | | |
| JRG-58-1 | | | 43.9 | 45.9 | 54.6 |
| JRG-58-2 | | | 33.3 | 43.2 | 52.6 |
| SRG-58-1 | | | 36.6 | 46.6 | 61.2 |
| SRG-58-2 | NO | | 57.2 | 60.6 | 65.9 |
| JRG-330-1 | DATA | | 29.3 | 33.3 | 40.0 |
| JRG-330-2 | TAKEN | | 27.9 | 36.6 | 46.6 |
| SRG-330-1 | | | 36.6 | 43.3 | 56.6 |
| SRG-330-2 | | | 34.6 | 36.6 | 56.6 |
| Test Date 4-11-66 | | | 91°F/50% RH | | |
| TW6-J-1 | | | 11.4 | 16.2 | 20.1 |
| TW6-J-2 | | | 11.4 | 15.9 | 21.0 |
| JRG-213-1 | | | 12.0 | 15.9 | 20.7 |
| JRG-213-2 | | | 12.0 | 16.5 | 20.4 |
| 20395-J-1 | | | 12.0 | 16.2 | 22.2 |
| 20395-J-2 | NO | | 12.6 | 16.5 | 22.2 |
| Times-J-1 | DATA | | 14.7 | 19.2 | 27.0 |
| Times-J-2 | TAKEN | | 14.4 | 19.8 | 26.4 |
| 77314-J-1 | | | 12.0 | 18.0 | 27.0 |
| 77314-J-2 | | | 12.3 | 18.0 | 24.0 |
| 20423-J-1 | | | 10.8 | 15.6 | 19.8 |
| 20423-J-2 | | | 11.1 | 15.9 | 19.2 |
| JRG-9-1 | | | 12.6 | 17.1 | 19.5 |
| JRG-9-2 | | | 12.9 | 16.8 | 19.8 |
| Test Date 1-6-66 | | | 86°F/75% RH | | |

TABLE 3 (Continued)

| Sample No. | 1 GHz | 1.5 GHz | 2 GHz | 3 GHz | 4 GHz |
|---|---|---|---|---|---|
| TW6-S-1 | | | 10.8 | 14.4 | 18.6 |
| TW5-S-2 | | | 11.1 | 13.8 | 18.3 |
| SRG-213-1 | | | 11.7 | 16.2 | 20.4 |
| SRG-213-2 | | | 13.2 | 17.1 | 20.4 |
| 20395-S-1 | | | 11.4 | 16.5 | 21.0 |
| 20395-S-2 | NO DATA TAKEN | | 11.7 | 16.5 | 22.5 |
| Times-S-1 | | | 15.0 | 20.4 | 26.1 |
| Times-S-2 | | | 15.6 | 21.0 | 27.0 |
| 77314-S-1 | | | 11.7 | 16.5 | 25.5 |
| 77314-S-2 | | | 11.7 | 16.5 | 24.0 |
| 20423-S-1 | | | 11.1 | 15.0 | 19.5 |
| 20423-S-2 | | | 10.8 | 14.4 | 19.5 |
| SRG-9-1 | | | 12.6 | 16.5 | 19.5 |
| SRG-9-2 | | | 12.6 | 16.5 | 19.5 |
| Test Date 1-6-66 | | | 87°F/72% RH | | |
| TW6-J-1 | | | 11.7 | 14.7 | 18.3 |
| TW6-J-2 | | | 11.1 | 14.7 | 21.0 |
| JRG-213-1 | | | 10.8 | 15.3 | 18.9 |
| JRG-213-2 | | | 11.7 | 15.6 | 18.6 |
| 20395-J-1 | | | 12.6 | 15.6 | 21.9 |
| 20395-J-2 | NO DATA TAKEN | | 12.6 | 16.5 | 22.5 |
| Times-J-1 | | | 15.0 | 20.7 | 27.0 |
| Times-J-2 | | | 15.0 | 20.4 | 26.4 |
| 77314-J-1 | | | 11.4 | 16.2 | 24.0 |
| 77314-J-2 | | | 12.0 | 18.0 | 24.6 |
| JRG-9-1 | | | 12.9 | 16.8 | 19.8 |
| JRG-9-2 | | | 13.2 | 16.8 | 19.8 |
| 20423-J-1 | | | 10.8 | 14.4 | 18.0 |
| 20423-J-2 | | | 10.8 | 15.0 | 18.6 |
| Test Date 4-6-66 | | | 88°F/52% RH | | |
| TW6-S-1 | | | 10.8 | 14.4 | 18.9 |
| TW6-S-2 | | | 11.1 | 14.4 | 18.6 |
| SRG-213-1 | | | 11.7 | 16.2 | 19.4 |
| SRG-213-2 | | | 15.0 | 18.6 | 22.8 |
| 20395-S-1 | | | 11.7 | 15.9 | 21.0 |
| 20395-S-2 | NO DATA TAKEN | | 11.7 | 16.5 | 22.5 |
| Times-S-1 | | | 14.1 | 18.6 | 24.6 |
| Times-S-2 | | | 15.0 | 20.4 | 26.4 |
| 77314-S-1 | | | 11.4 | 16.5 | 25.5 |
| 77314-S-2 | | | 11.4 | 16.2 | 23.4 |
| 20423-S-1 | | | 11.4 | 15.0 | 19.5 |
| 20423-S-2 | | | 11.4 | 15.6 | 19.8 |
| SRG-9-1 | | | 12.6 | 16.5 | 19.5 |
| SRG-9-2 | | | 12.9 | 16.5 | 19.5 |
| Test Date 4-6-66 | | | 86°F/60% RH | | |

It is of interest to note that the coating with silicone oil during the inspection trip of September 1965 did not arrest the corrosion process on the outer and threaded surfaces of the coaxial connectors.

Twenty-Six Pair "Hermophrodite" Connector

This connector was inspected and found to be in excellent service condition both at the shore and jungle exposure sites. The only observations are rusted lockwashers at the shore location and evidence of small insects or spiders at the jungle location.

Multiconductor Field Telephone Cable WM-130, per MIL-E-55036

The cut end of this cable was found to be rusted.

Telephone Pair, Tropical and Assault Cable (Development Contract)

This cable was put out after the September 1965 inspection with over one mile exposed in the jungle area. Prior to May 1966, a break in continuity had been recorded and a search was initiated to locate the fault. The search was completed during the May 1966 inspection visit. The cable was found to have been attacked by some animal. The majority of the gnawed sections consisted of cuts of the insulation only. The fault was never determined due to the lack of a clean cut break of one of the conductors.

Approximately 1000 feet of the wire were removed from the jungle and in this process several mechanical and electrical separations developed. Since this portion had the greatest concentration of gnawed sections, it was suspected as containing the fault. This was not correct. The fault continued to exist in the remaining 4000 feet of wire. Figure 29 illustrates one of the gnawed spots.

Figure 29. Gnawed Tropical and Assault Cable (Development Control)

Telephone Wires, WD-1, WD-1 Modified, and WF-16

These were observed to lack any visible degradation throughout the jungle run. Particularly, they were without any marks denoting animal attack. However, during a visit in 1965, a sample of WD-1 modified wire was found which had been attacked by animals. At the shore site, the insulation of WD-1 modified wire had blemish spots.

2.16 Resistor, Composition, Hermetically Sealed, RO (Phase II)

Visual inspection of the RC08 resistors after 7 months at tropical exposure is summarized as follows:

JRO - Clean

JERO - Clean to slight discoloration of leads

SRO - Lead corrosion general and near terminal seal

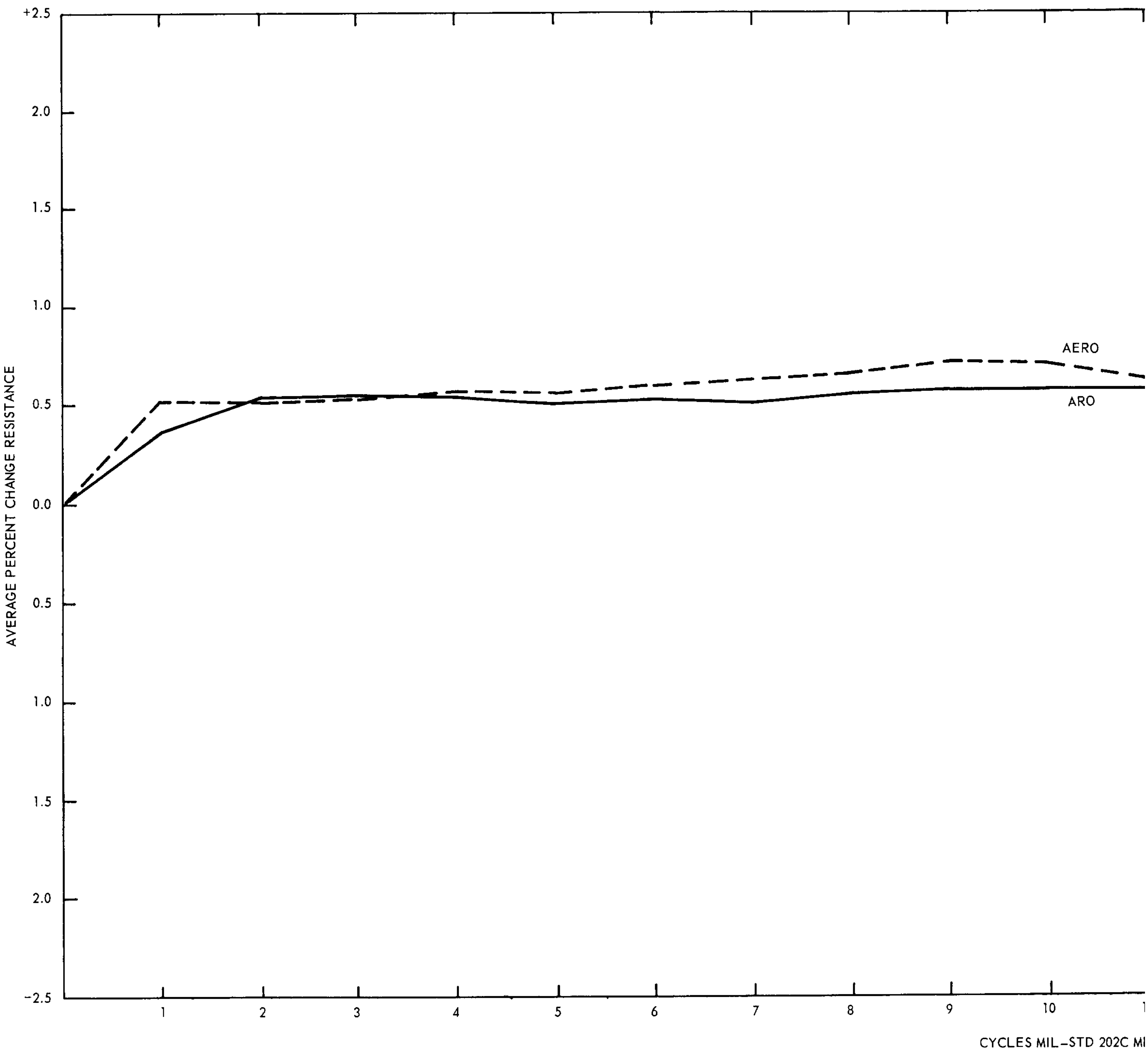
SERO - Lead corrosion general with heavier deposits near terminal seal

Accelerated Stress Test Results

The sealed and insulated composition RC08 resistors exhibited only positive value changes during the MIL-STD-202C, Method 106B test. The maximum increase was +1.02 percent for one of the energized units with the averages of the maximums being +0.60 percent for the unenergized and +0.70 percent for the energized lots. The processed data summary is given in table D-1 of appendix D. The average percent change is plotted in figure 30.

This test did not produce any discernible mechanism of failure, and and only slight degradation.

E5687



+2.5
2.0
1.5
1.0
0.5
0.0
0.5
1.0
1.5
2.0
-2.5
AVERAGE PERCENT CHANGE RESISTANCE
AERO
ARO
1
2
3
4
5
6
7
8
9
10
CYCLES MIL-STD 202C MI


(1)

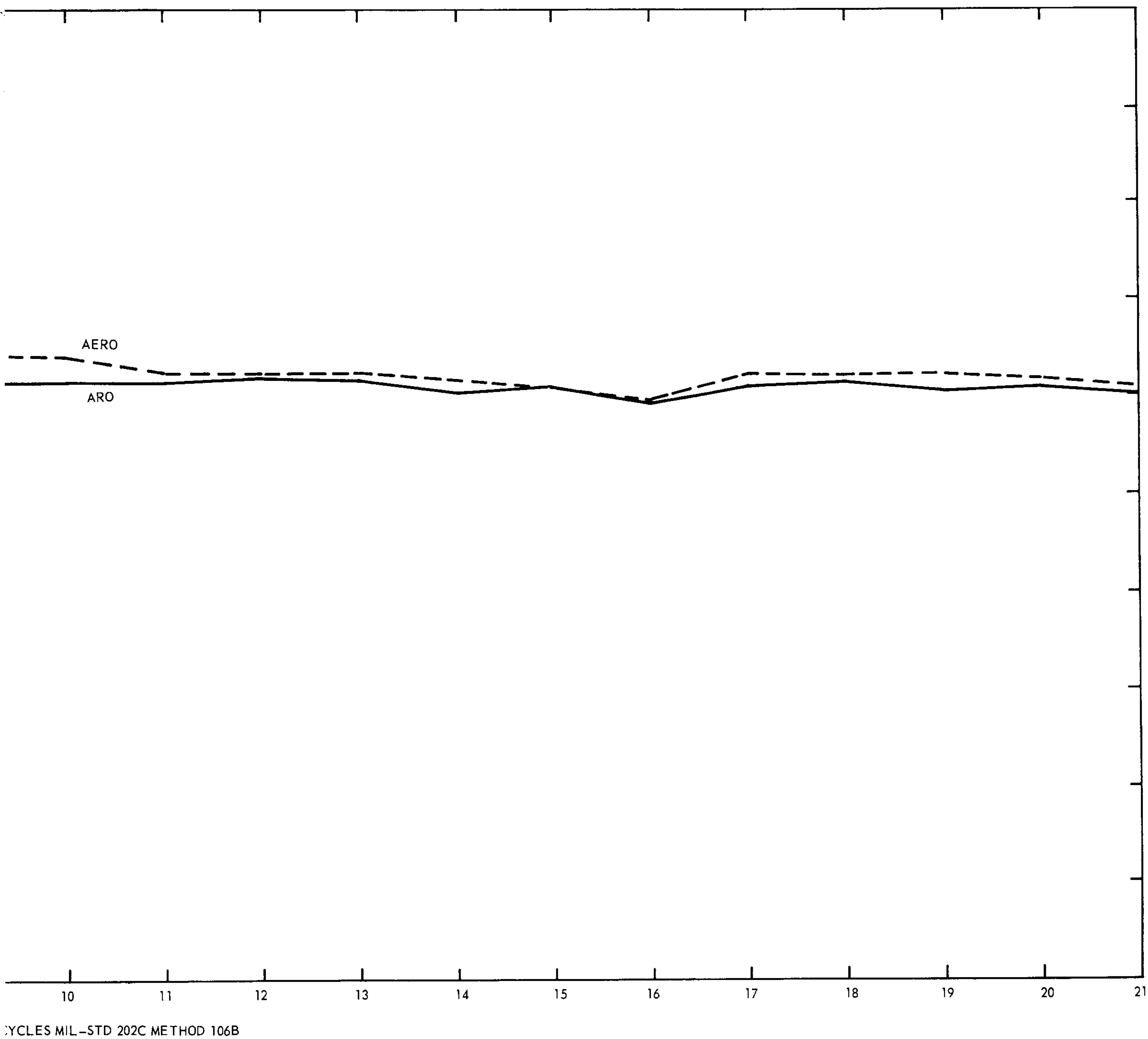



Figure 30. Accelerated Life Test Group RO, MIL-STD 202C Method 106B



2

## 2.17 Resistor, Fixed, Tin-Oxide Film, RL (Phase II)

Visual inspection of the MIL-type RL07 tin-oxide film resistors after 7 months of tropical exposure revealed the following:

JRL - No degradation

JERL - No degradation

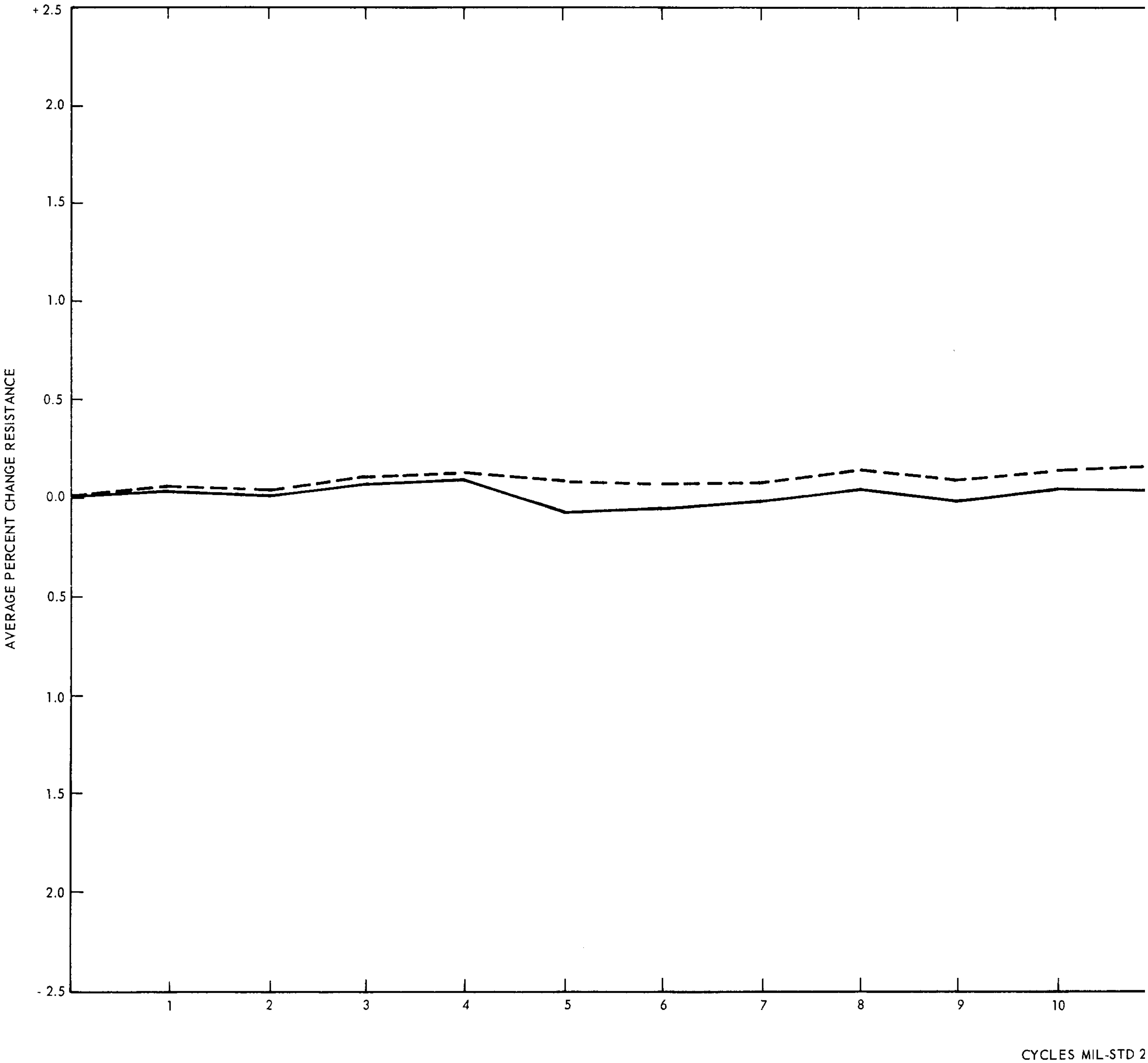
SRL - General and uniform lead corrosion

SERL - General lead corrosion more intense than for the SRL's

### Accelerated Stress Test Results

The drift and change in value of the tin-oxide film resistors during the MIL-STD-202C Method 106B stress test was within one order of magnitude less than the specified procurement tolerances. The maximum deviation for a single unit was -0.33 percent and the average of the maximum deviations would be +0.15 percent for the energized lots. The data summaries for the complete test are given in table D-2 of appendix D. The average percent change for the two test groups is plotted in figure 31.

E5689



+ 2.5
2.0
1.5
1.0
0.5
0.0
0.5
1.0
1.5
2.0
- 2.5
AVERAGE PERCENT CHANGE RESISTANCE
1
2
3
4
5
6
7
8
9
10
CYCLES MIL-STD 2


1

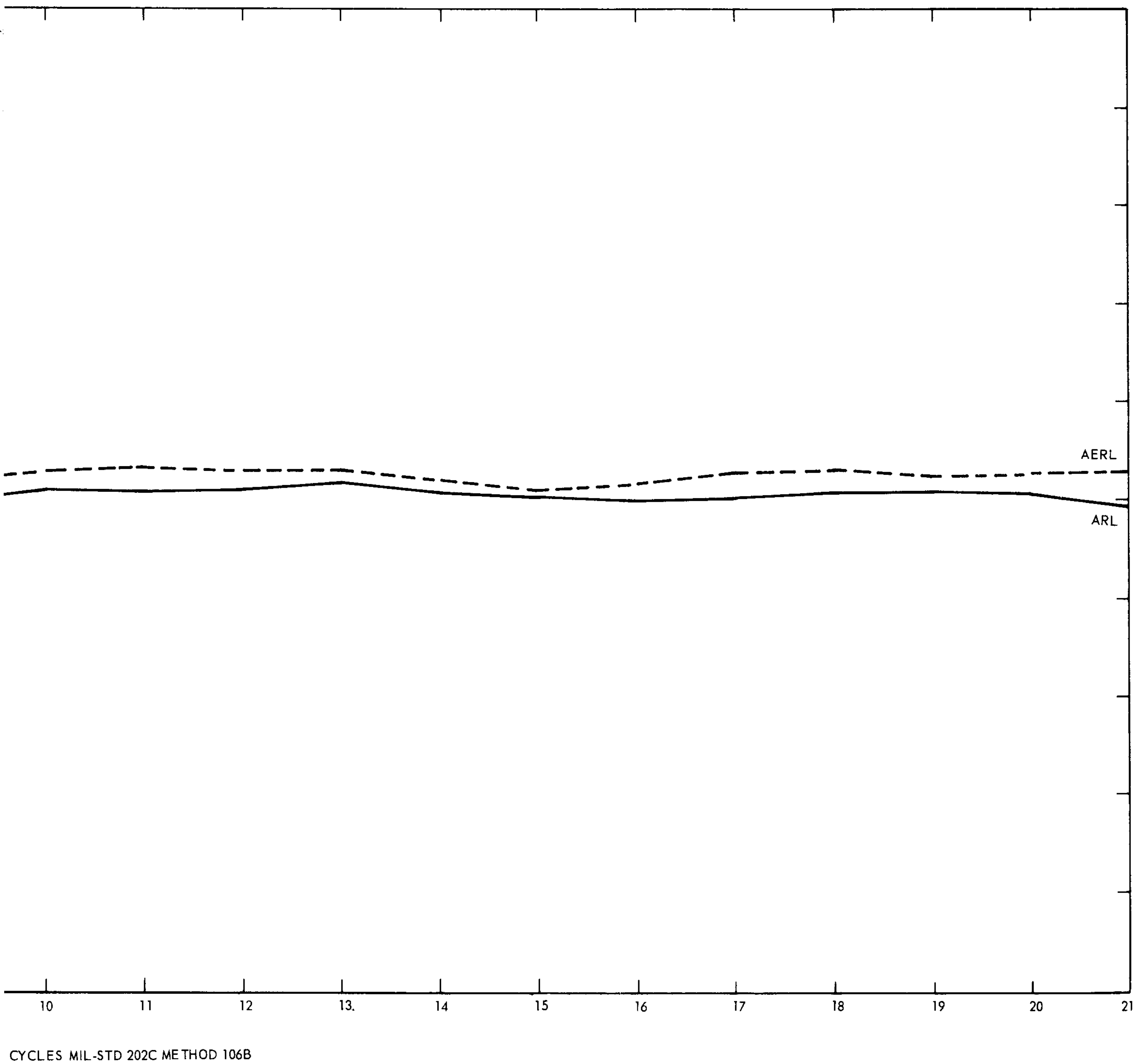



Figure 31. Accelerated Life Test Group RL, MIL-STD 202C Method 106B



2

2.18 Resistor, Fixed, Metal Film, MF (Phase II)

Visual inspection of the MIL-type RN60C metal film fixed resistors after 7 months of tropical exposure revealed the following:

JMF - Slight lead discoloration.

JEMF - Slight lead discoloration.

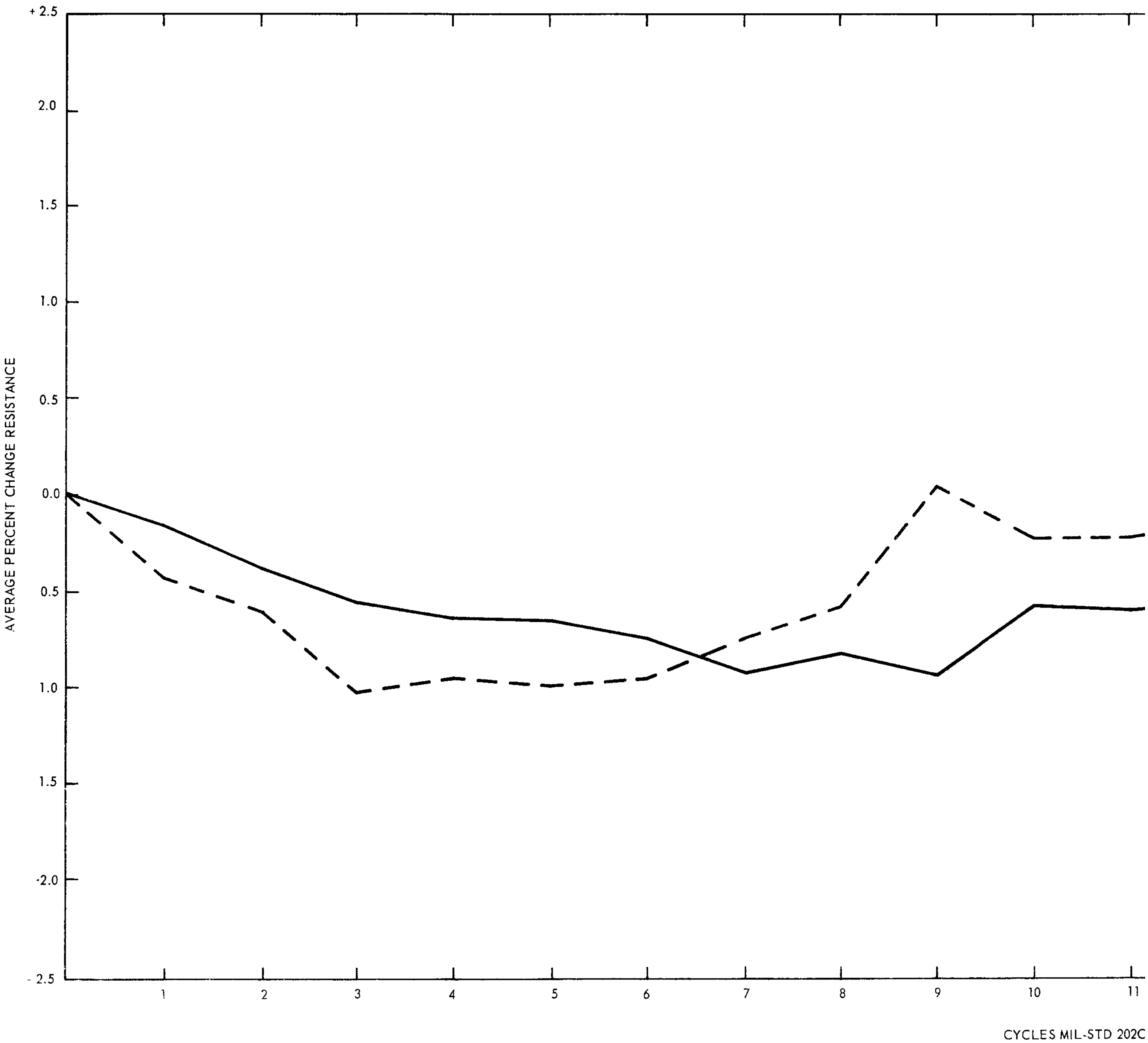
SMF - Lead corrosion; slight discoloration at terminal area at body.

SEMF - Heavy corrosion at negative terminal at resistor body; general lead corrosion.

Accelerated Stress Test Results

The RN60C metal film resistors suffered value changes greater than ±1 percent of the initial value. Fifty percent were measured outside the procurement specification limits of 9,900 to 10,100 ohms. The data summary is given in table D-3 of appendix D. The average percent change is plotted in figure 32. The data and plot indicate degradation which could be from moisture due to lack of sealing around the terminal leads. This possibility was pointed out in the third quarterly report, reference 11. In addition, reference 11 noted that the conformal coating over the resistor surface was uneven, which could allow moisture to reach the metal film.

E5688


+ 2.5
2.0
1.5
1.0
0.5
0.0
0.5
1.0
1.5
-2.0
- 2.5
AVERAGE PERCENT CHANGE RESISTANCE
1
2
3
4
5
6
7
8
9
10
11
CYCLES MIL-STD 202C

1

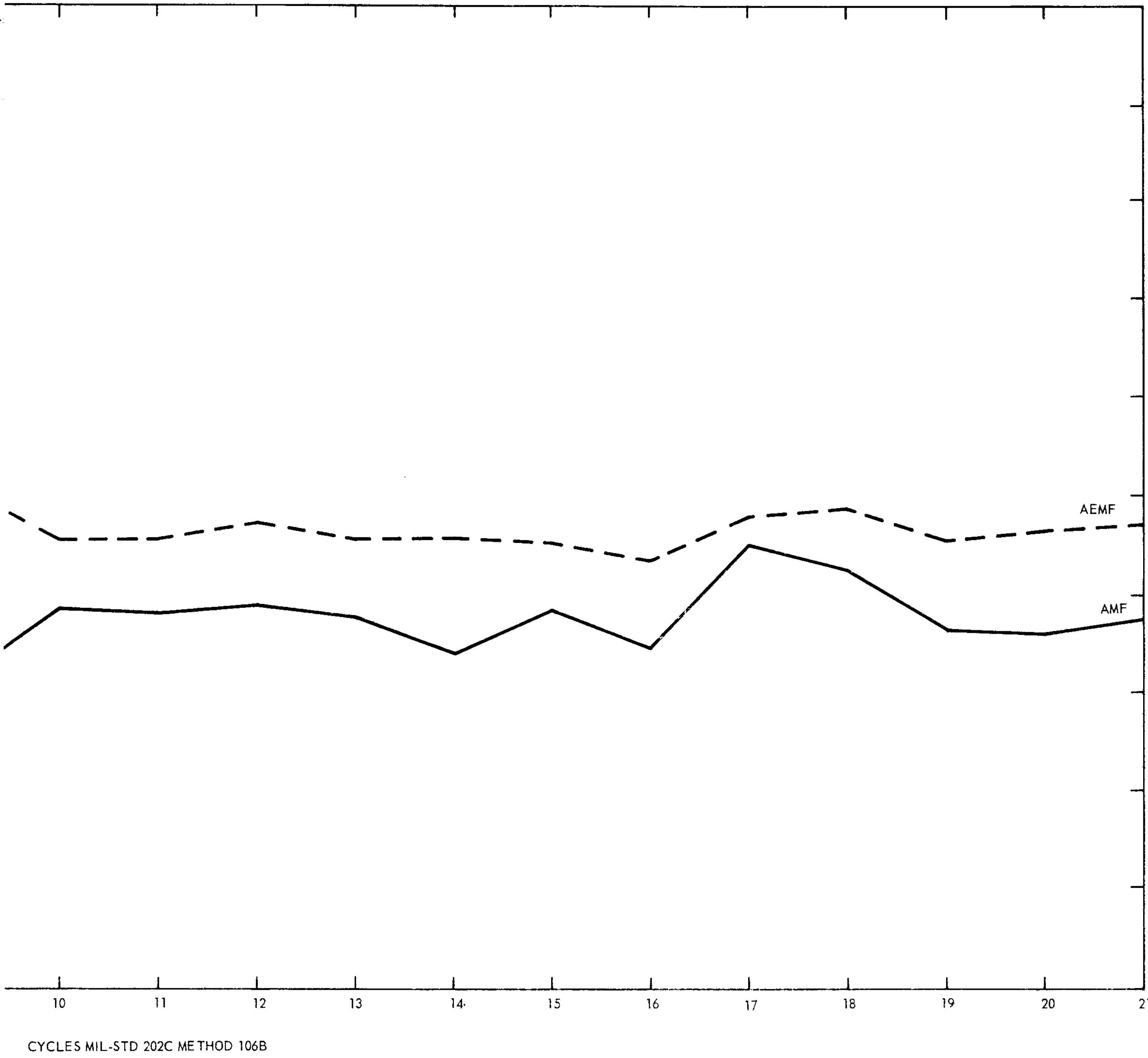



Figure 32. Accelerated Life Test Group MF, MIL-STD 202C Method 106B

2.19 Resistor, Variable, Cermet, RJ (Phase II)

The visual inspection of the MIL-type RJ12 variable resistor after 7 months of tropical exposure is summarized as follows:

JRJ - No visible evidence of degradation

JERJ - No visible evidence of degradation

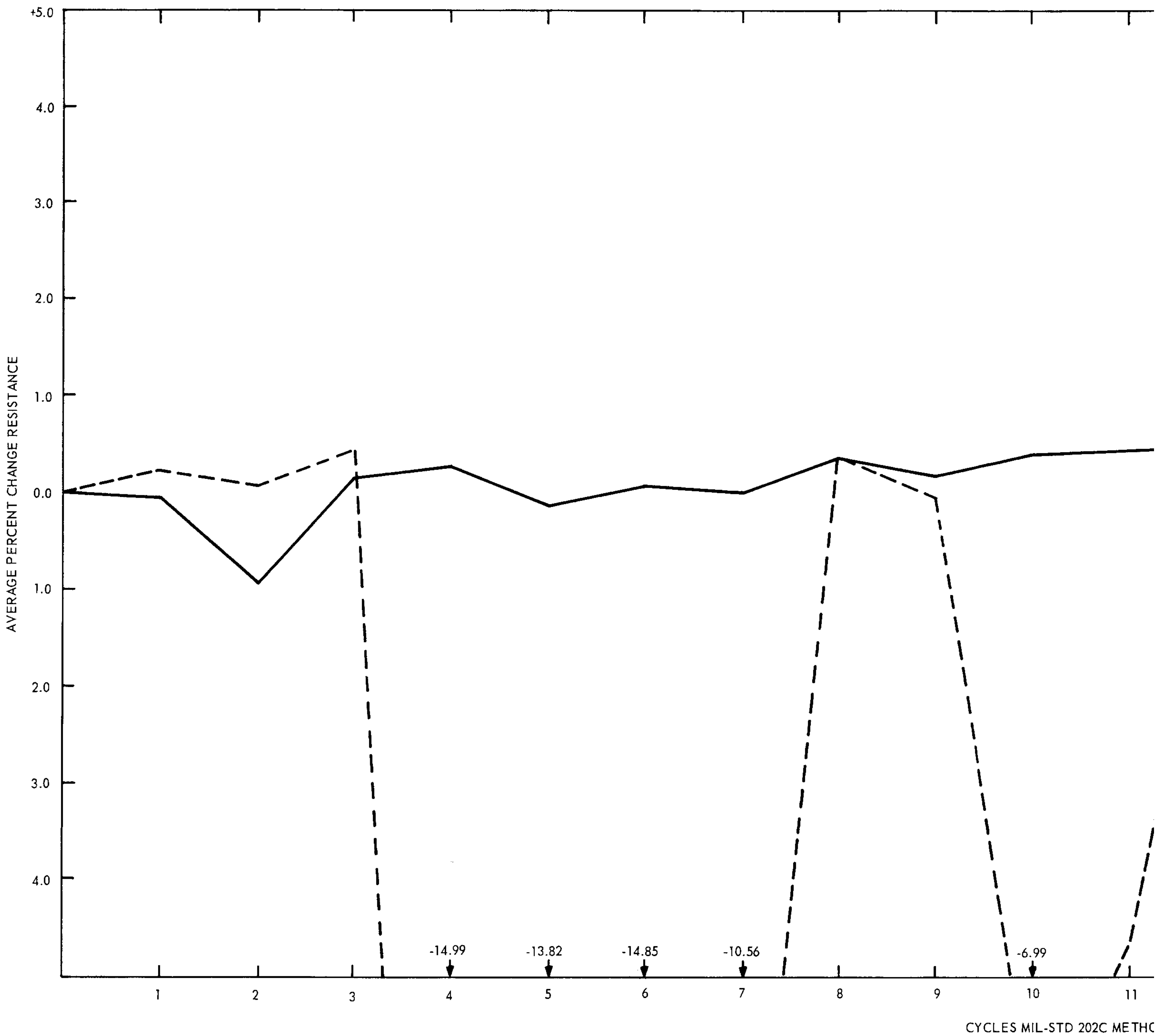
SRJ - No visible evidence of degradation or corrosion

SERJ - No visible evidence of degradation or corrosion

The field data for this component reveal a small number of failures due to reduced value and erratic performance. This is similar to the data reported below from the accelerated stress test. Since no attempt was made to effect a recovery (i.e., drying out), it can only be assumed that moisture accumulation inside the component is the responsible mechanism.

Accelerated Stress Test Results

The cermet variable resistors were observed to be very stable except for one unit which had a 76 percent reduction in value. This change is attributed to moisture accumulation within the unit. Also it must be noted that recovery did take place prior to the conclusion of the test. The other units had small maximum value changes ranging from -0.43 percent to +2.02 percent. The summary data are given in table D-4 of appendix D and the average percent change is plotted in figure 33.


+5.0
4.0
3.0
2.0
1.0
0.0
1.0
2.0
3.0
4.0
AVERAGE PERCENT CHANGE RESISTANCE
-14.99
-13.82
-14.85
-10.56
-6.99
1
2
3
4
5
6
7
8
9
10
11
CYCLES MIL-STD 202C METHO

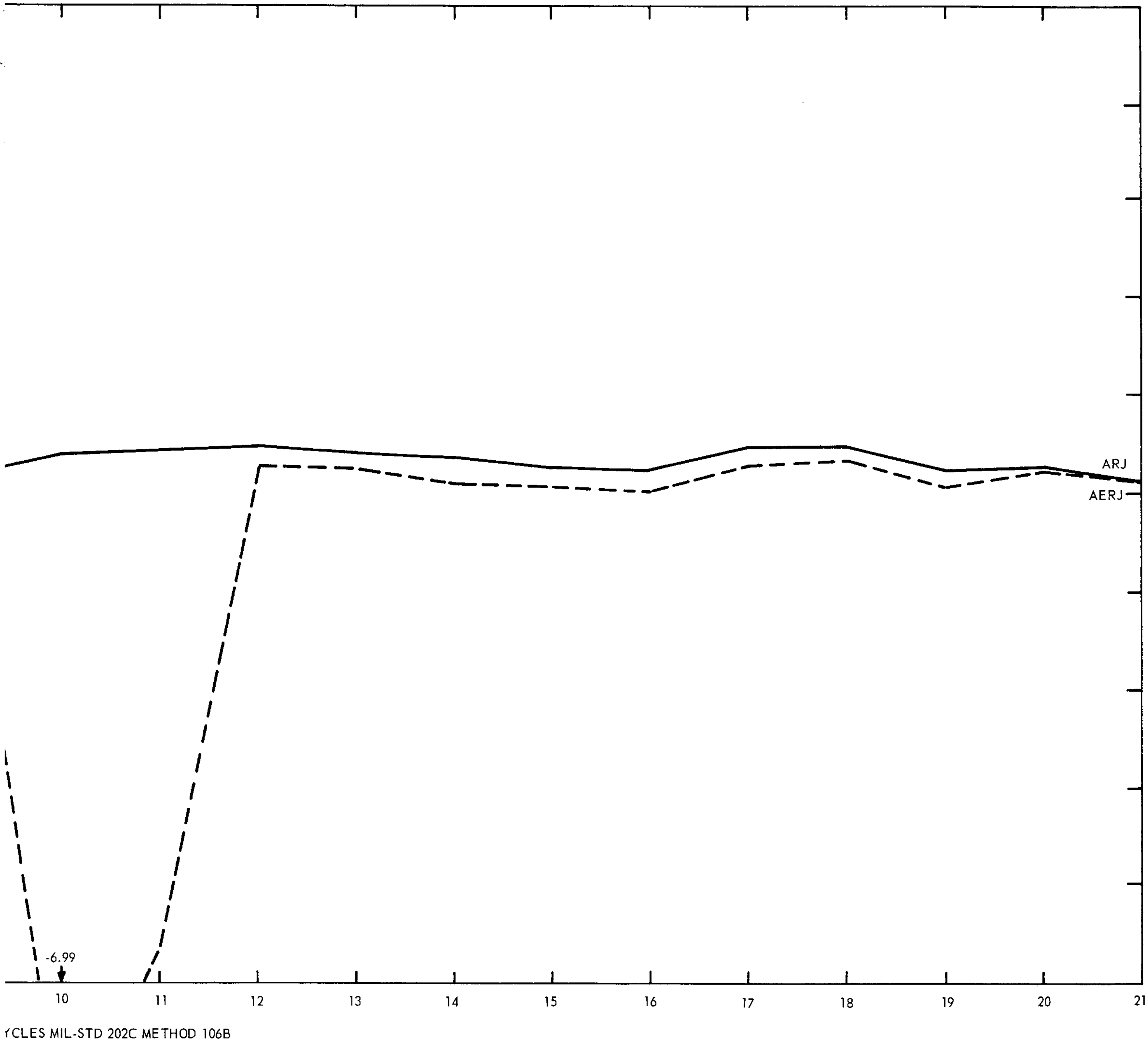



Figure 33. Accelerated Life Test Group RJ, MIL-STD 202C Method 106B

2.20 Capacitor, Fixed, Tantalum, Solid-Electrolyte, TA (Phase II)

Visual inspection of the TAM-type electrolytic capacitors after 7 months of tropical exposure is summarized as follows:

JTA - Slight discoloration of leads

JETA - Slight discoloration of leads

STA - General lead corrosion

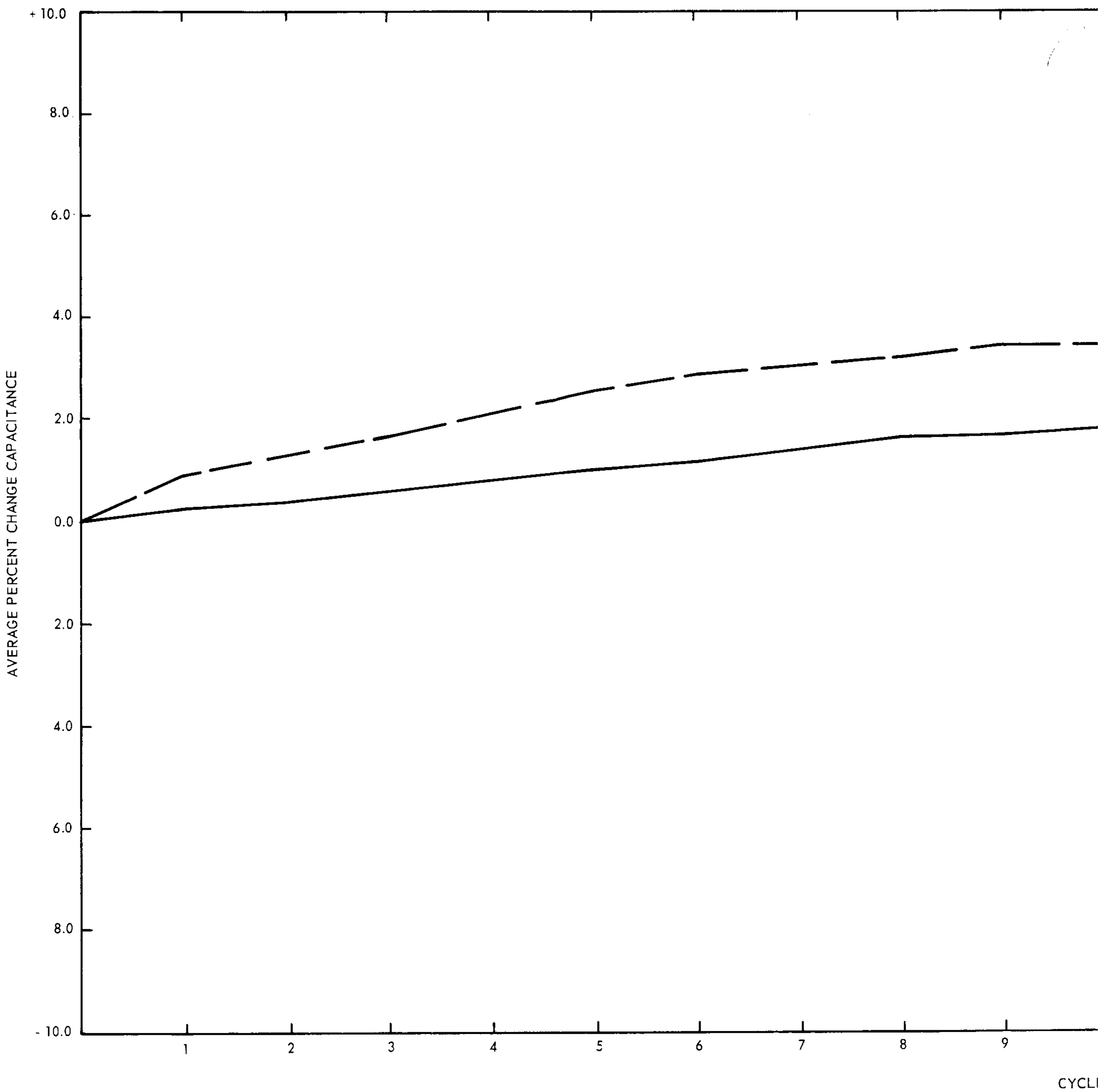
SETA - General lead corrosion more severe near capacitor body

Accelerated Stress Test Results

The TAM sintered-powder tantalum electrolytic capacitors were observed to exhibit stability well within the tolerance limits specified for the component. The change for both lots had the same characteristics of increased capacitance and increased dissipation factor. See table 4.

The greater increases in capacitance and dissipation factors for the energized vs the unenergized lot can be attributed to long-term polarization. The summary data printout for this test is given in table D-5 of appendix D and the average percent change in capacitance is plotted in figure 34.

E5695



+10.0
8.0
6.0
4.0
2.0
0.0
2.0
4.0
6.0
8.0
-10.0
AVERAGE PERCENT CHANGE CAPACITANCE
1
2
3
4
5
6
7
8
9
CYCL


1

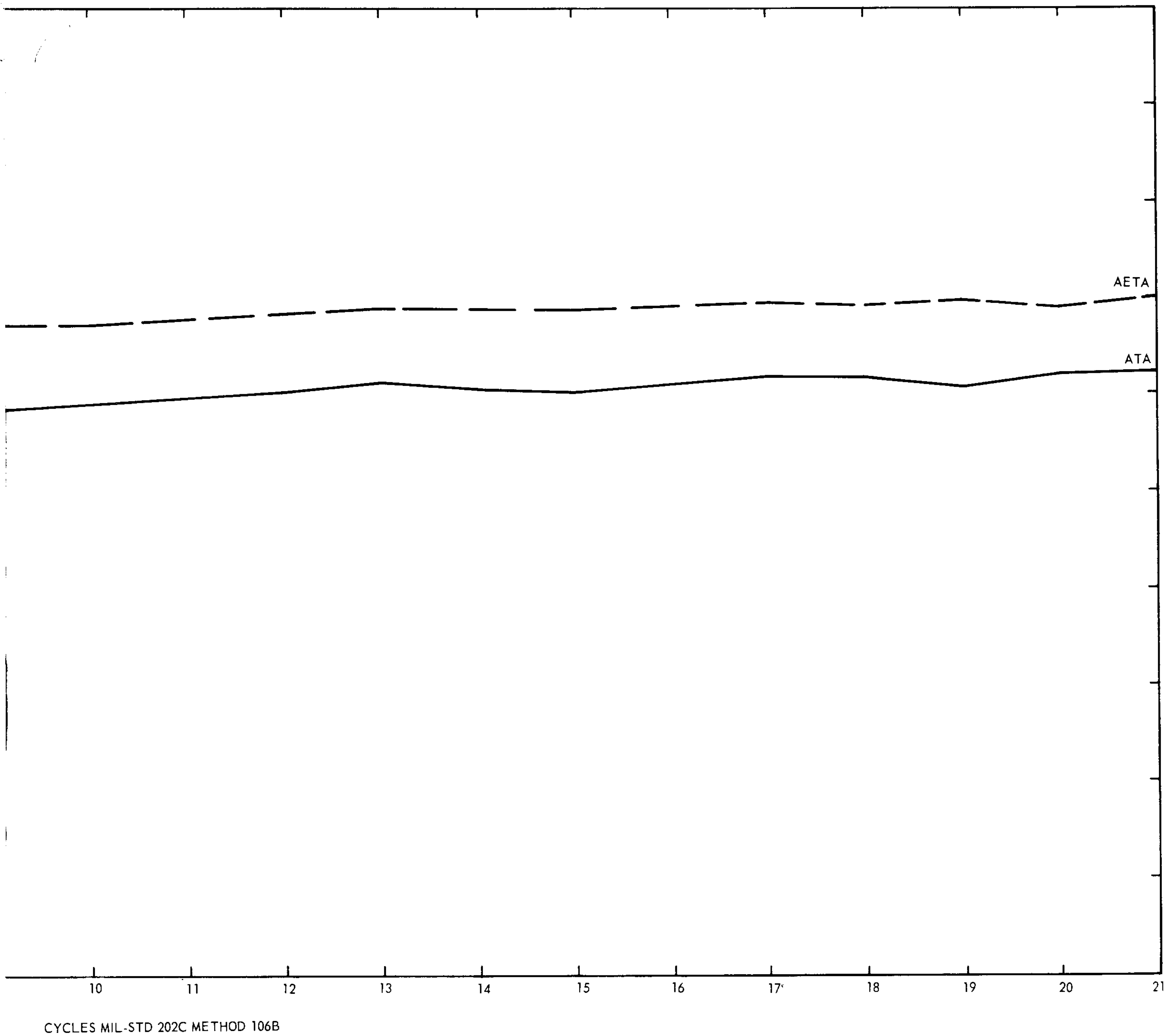



Figure 34. Accelerated Life Box Group TA, MIL-STD 202C Method 106B

TABLE 4. MIL-STD-202C METHOD 106B STRESS TEST, ELECTROLYTIC CAPACITORS, TA, INCREMENTAL CHANGE DATA, CAPACITANCE

| Component Number | Initial values | | Maximum+ | | Increase (%) |
|---|---|---|---|---|---|
| | C* | D** | C | D | $\Delta C^{++}$ |
| ATA-1 | 110.5 | 0.106 | 11.27 | 0.120 | +2.0 |
| ATA-2 | 10.56 | 0.054 | 10.82 | 0.058 | +2.1 |
| ATA-3 | 11.10 | 0.096 | 11.40 | 0.111 | +2.7 |
| ATA-4 | 10.22 | 0.118 | 10.48 | 0.137 | +2.4 |
| ATA-5 | 10.80 | 0.112 | 11.06 | 0.124 | +2.4 |
| AETA-1 | 11.03 | 0.140 | 11.45 | 0.175 | +3.8 |
| AETA-2 | 10.93 | 0.082 | 11.49 | 0.100 | +5.1 |
| AETA-3 | 11.00 | 0.069 | 11.44 | 0.085 | +4.0 |
| AETA-4 | 10.98 | 0.084 | 11.37 | 0.100 | +3.5 |
| AETA-5 | 11.04 | 0.163 | 11.39 | 0.190 | +3.2 |

*C = Capacitance in microfarads.
**D = Dissipation factor.
+Maximum = maximum value recorded at any data point during test.
++$\Delta C$ = capacitance change in percent of initial value.

2.21 Capacitor, Fixed, Tantalum, Liquid-Electrolyte, CL (Phase II)

The visual inspection of the MIL-type CL24 capacitors after exposure for 7 months to tropical environment is summarized as follows:

JCL - Body tarnished; black specks on plastic end seals.

JECL - Body tarnished; black specks on plastic end seals.

SCL - Body tarnished; plastic end seals appear dirty with gray and black specks.

SECL - Body tarnished; plastic end seals appear dirty with gray and black specks.

Figure 35 is a photograph of the jungle-exposed CL capacitors. The discoloration of the end seals can be seen.

Accelerated Stress Testing Results

The etched-foil tantalum liquid-electrolyte type CL capacitors withstood the MIL-STD 202C Method 106B 20-cycle exposure with only a very small increase in capacitance value and a slight change in dissipation factor. See table 5.

The greater change was in the energized units, due presumably to prolonged polarization.

The data summaries for this test for both lots are given in table D-6 of appendix D and the average percent change in capacitance is plotted in figure 36.

E5975
REF: 5315.00100-16

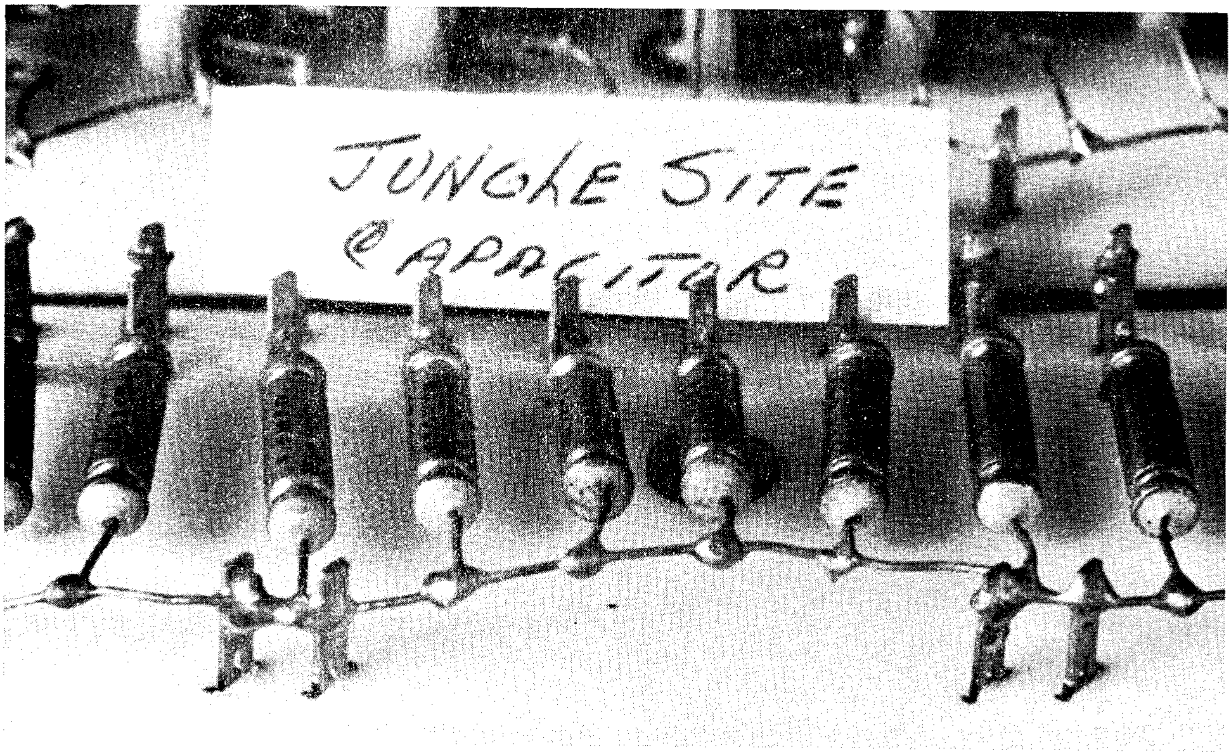
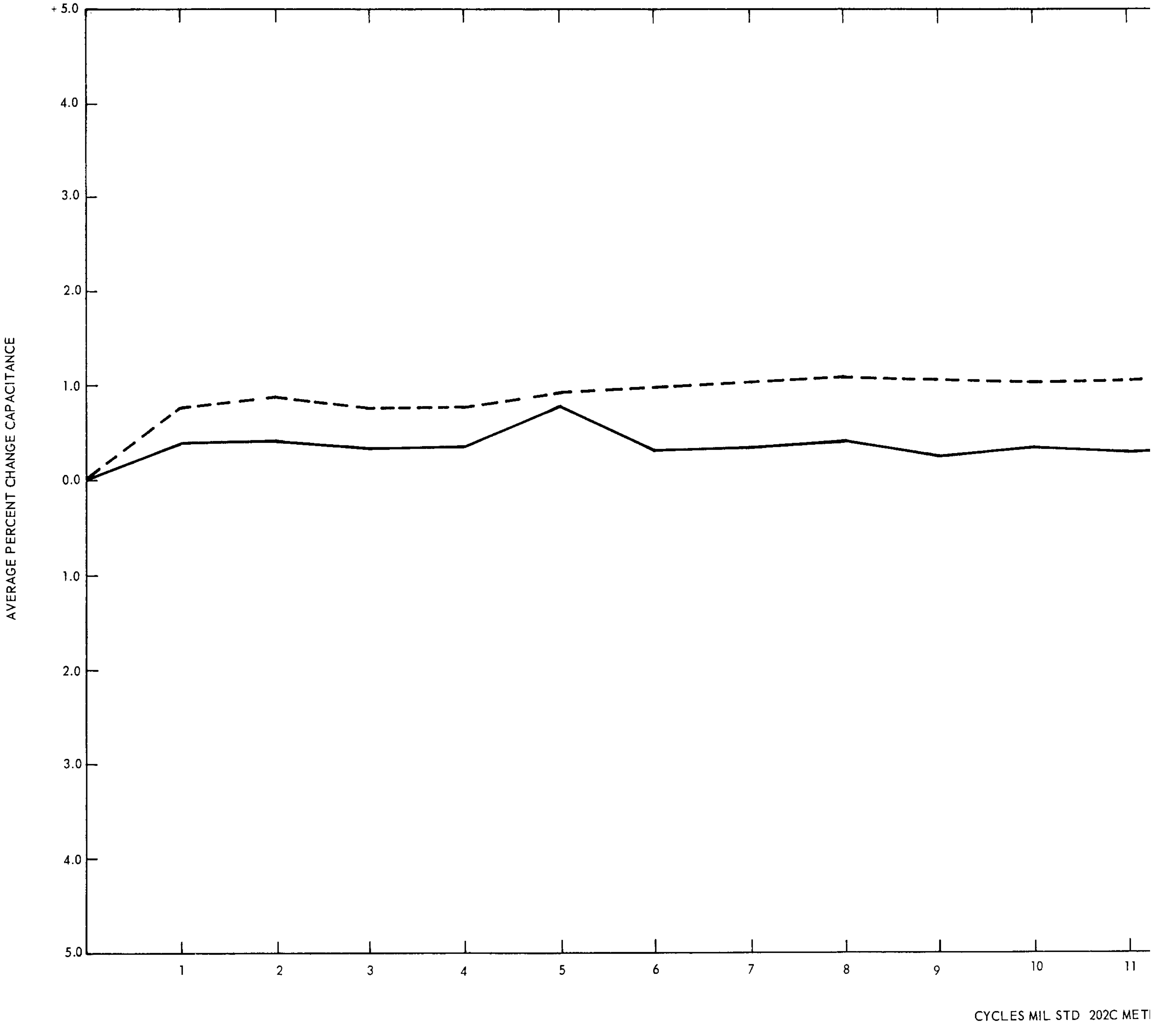



Figure 35. JCL Capacitor, Fixed, Tantalum, Black Specks on End Seals

E5698



AVERAGE PERCENT CHANGE CAPACITANCE
+ 5.0
4.0
3.0
2.0
1.0
0.0
1.0
2.0
3.0
4.0
5.0
1
2
3
4
5
6
7
8
9
10
11
CYCLES MIL STD 202C METI

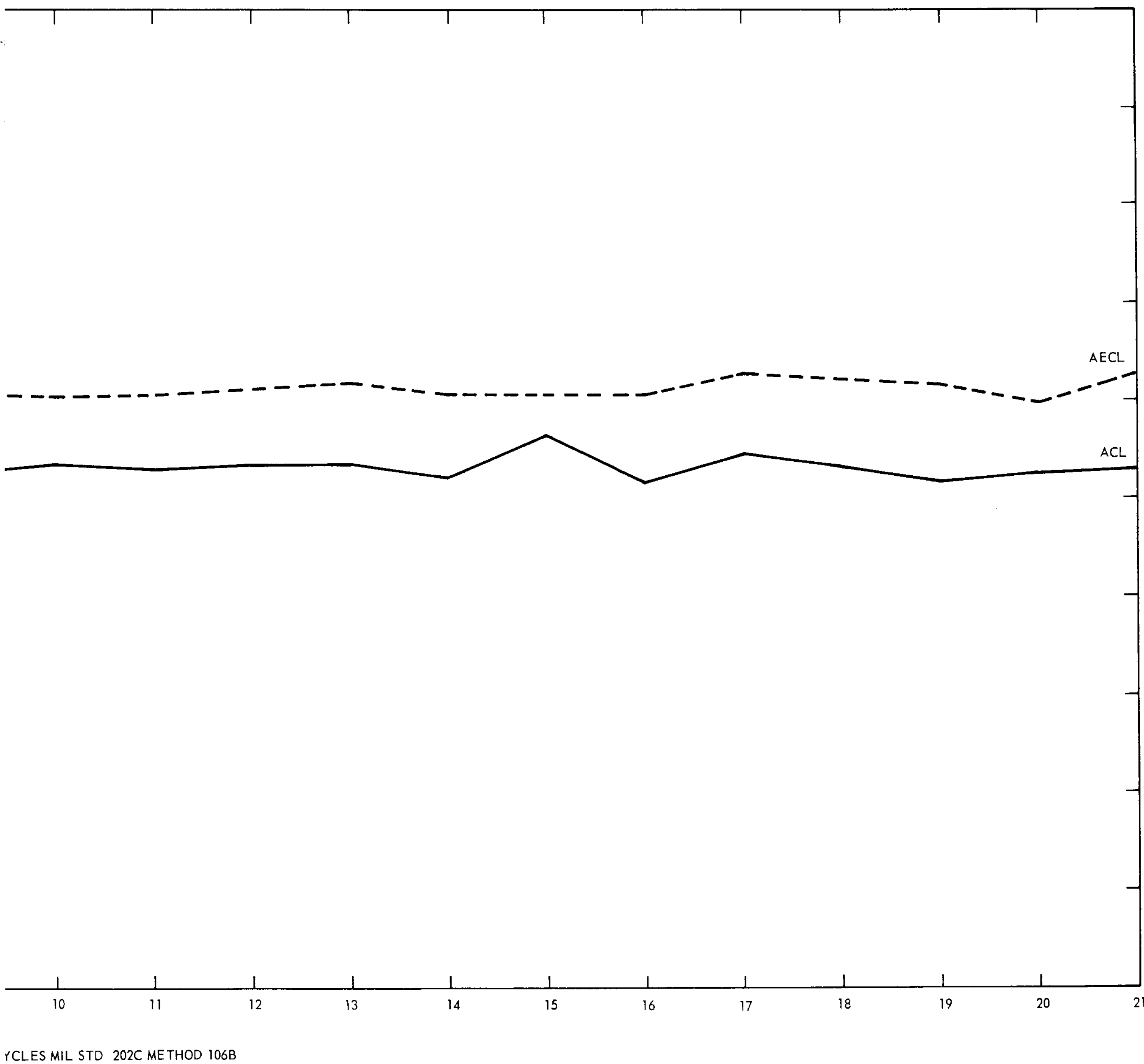



Figure 36. Accelerated Life Test Group CL, MIL-STD 202C Method 106B



2

TABLE 5. MIL-STD-202C METHOD 106B STRESS TEST, ELECTROLYTIC CAPACITOR, CL, INCREMENTAL CHANGE DATA, CAPACITANCE

| Component Number | Initial values C* | Initial values D** | Maximum+ C | Maximum+ D | Increase (%) ΔC++ |
|---|---|---|---|---|---|
| ACL-1 | 4.172 | .100 | 4.195 | .094 | +0.55 |
| ACL-2 | 5.444 | .090 | 5.467 | .082 | +0.42 |
| ACL-3 | 6.130 | .130 | 6.158 | .121 | +0.46 |
| ACL-4 | 3.673 | .086 | 3.690 | .081 | +0.46 |
| ACL-5 | 4.058 | .135 | 4.071 | .122 | +0.32 |
| AECL-1 | 5.070 | .130 | 5.126 | .126 | +1.1 |
| AECL-2 | 5.673 | .113 | 5.742 | .108 | +1.2 |
| AECL-3 | 4.947 | .116 | 4.989 | .118 | +0.85 |
| AECL-4 | 4.389 | .153 | 4.445 | .144 | +1.3 |
| AECL-5 | 3.974 | .127 | 4.050 | .114 | +1.9 |

*C = capacitance in microfarads.
**D = dissipation factor.
+maximum = max value recorded at any data point during test.
++ΔC = capacitance change in percent of initial value.

2.22 Capacitor, Fixed, Ceramic, KC (Phase II)

The multiplate ceramic capacitors were visually inspected after 7 months of tropical exposure. The observations are as summarized here:

JKC - No visible degradation or corrosion.

JEKC - No visible degradation or corrosion.

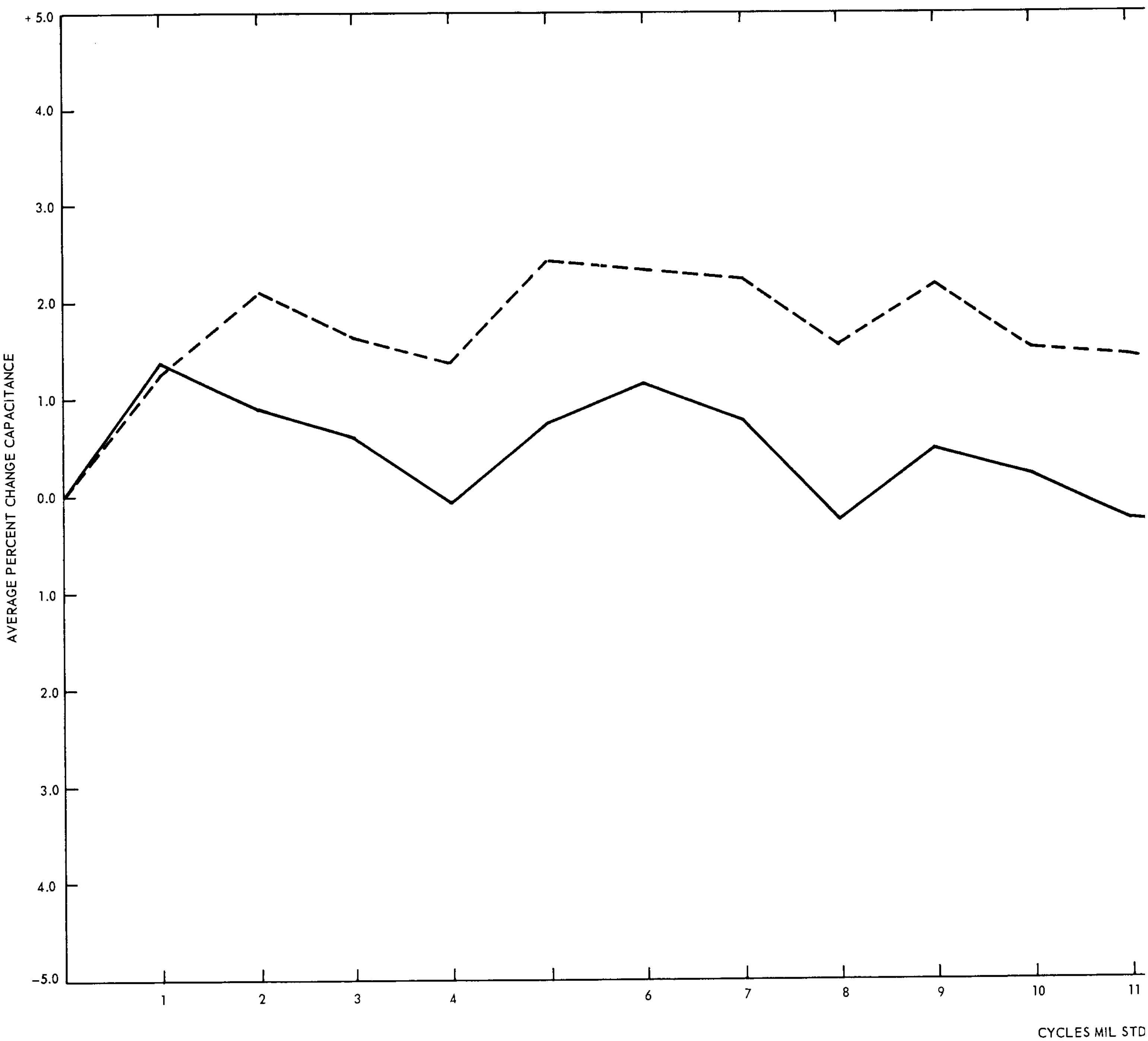
SKC - One broken lead, and a rupture at the joint of the lead and the fired pad, the exact cause of which is not known. Lead corrosion was present.

SEKC - Lead corrosion present.

Accelerated Stress Testing Results

The effect of temperature and humidity cycling per MIL-STD-202C Method 106B on the multiplate ceramic capacitors lacked direction for the nonenergized lot and was unidirectional for the energized lot. The values for dissipation factor remained very stable within the spread of 0.007 to 0.012. The data for this test are summarized and presented in table D-7 of appendix D and the average percent change in capacitance is plotted in figure 37.

E5697



+ 5.0
4.0
3.0
2.0
1.0
0.0
1.0
2.0
3.0
4.0
-5.0
AVERAGE PERCENT CHANGE CAPACITANCE
1
2
3
4
6
7
8
9
10
11
CYCLES MIL STD


1

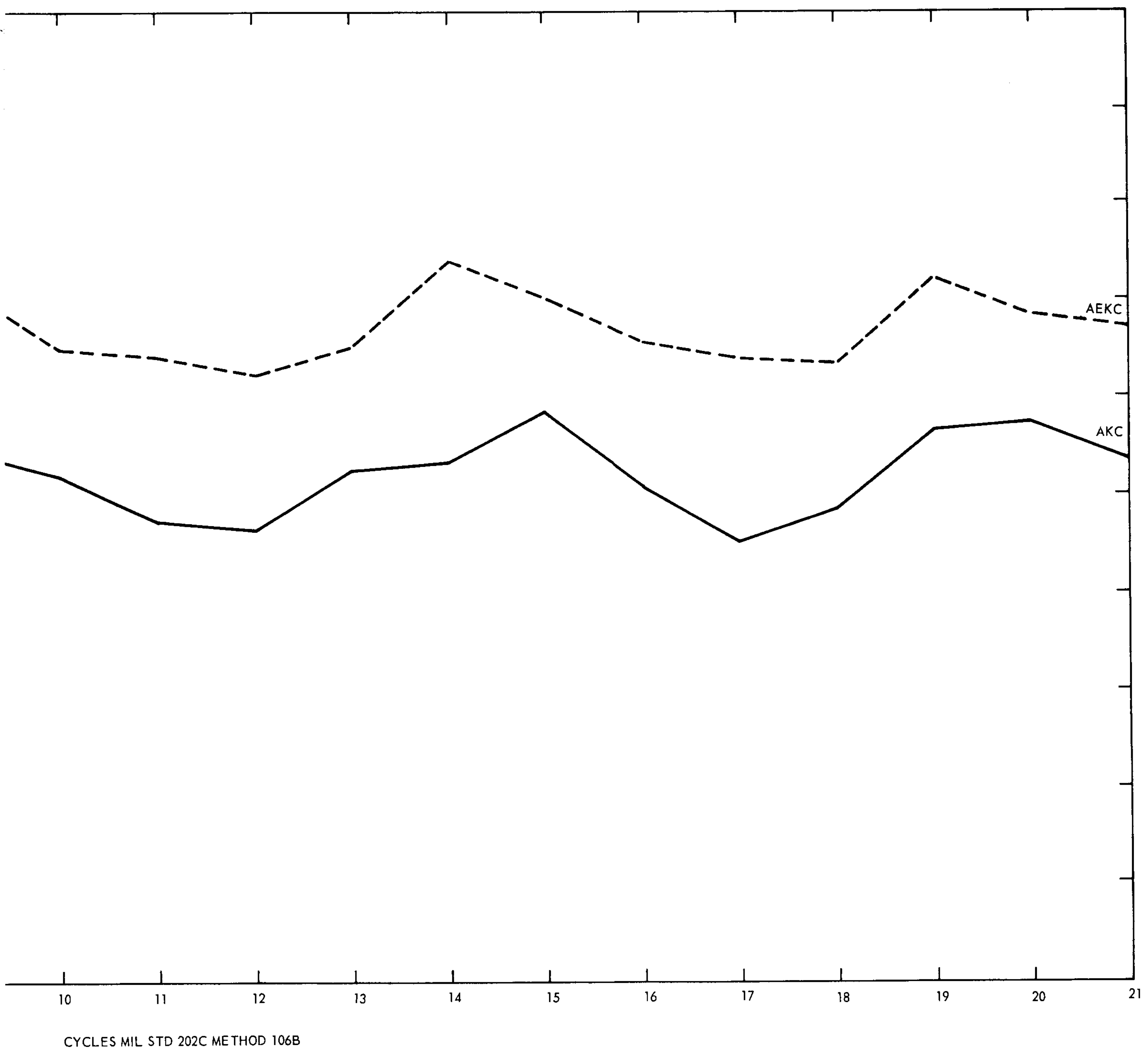



Figure 37. Accelerated Life Test Group KC, MIL-STD 202C Method 106B



2

2.23 Capacitor, Fixed, Ceramic, VK (Phase II)

The MIL-type CK05 ceramic capacitors exposed to tropical environment for 7 months were inspected. The comments are summarized here:

JVK - No visible degradation or corrosion

JEVK - No visible degradation or corrosion

SVK - Slight lead corrosion

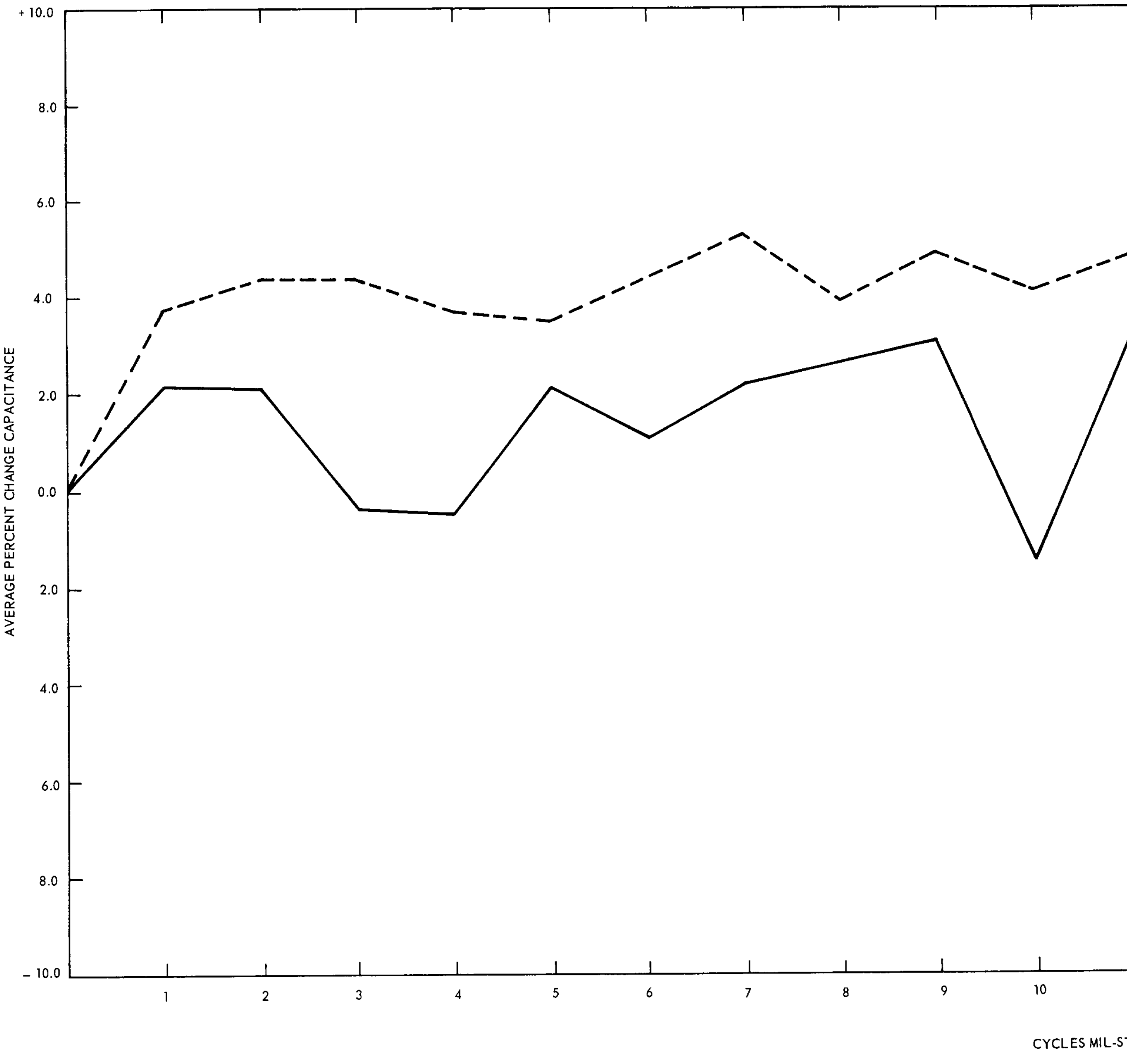
SEVK - Slight lead corrosion

Accelerated Stress Test Results

The single-plate CK05 capacitors were exposed to the specified 20-cycle temperature and humidity environment. The components have a nominal value of 220 picofarads, but when the capacitors were installed in the test chamber with cabled leads to allow measurements to be made outside the chamber without disturbing the component environment, the measured values increased by over 100 picofarads due to the distributed capacity of the cable. The data as taken and processed include this combined value. The accuracy of results cannot be determined, and therefore, the processed data are given only as an indication. The measurement of dissipation factor also lacks known accuracy because the cabling in combination with the other capacitors appeared to present phase-shifted signals which, when nulled out, represent a measurement error. In the future, attempts will be made to modify the test technique to reduce this source of error.

The processed data for this test are presented in table D-8 of appendix D and the average percent change in capacitance is plotted in figure 38.

E5696



+ 10.0
8.0
6.0
4.0
2.0
0.0
2.0
4.0
6.0
8.0
– 10.0
AVERAGE PERCENT CHANGE CAPACITANCE
1
2
3
4
5
6
7
8
9
10
CYCLES MIL-S

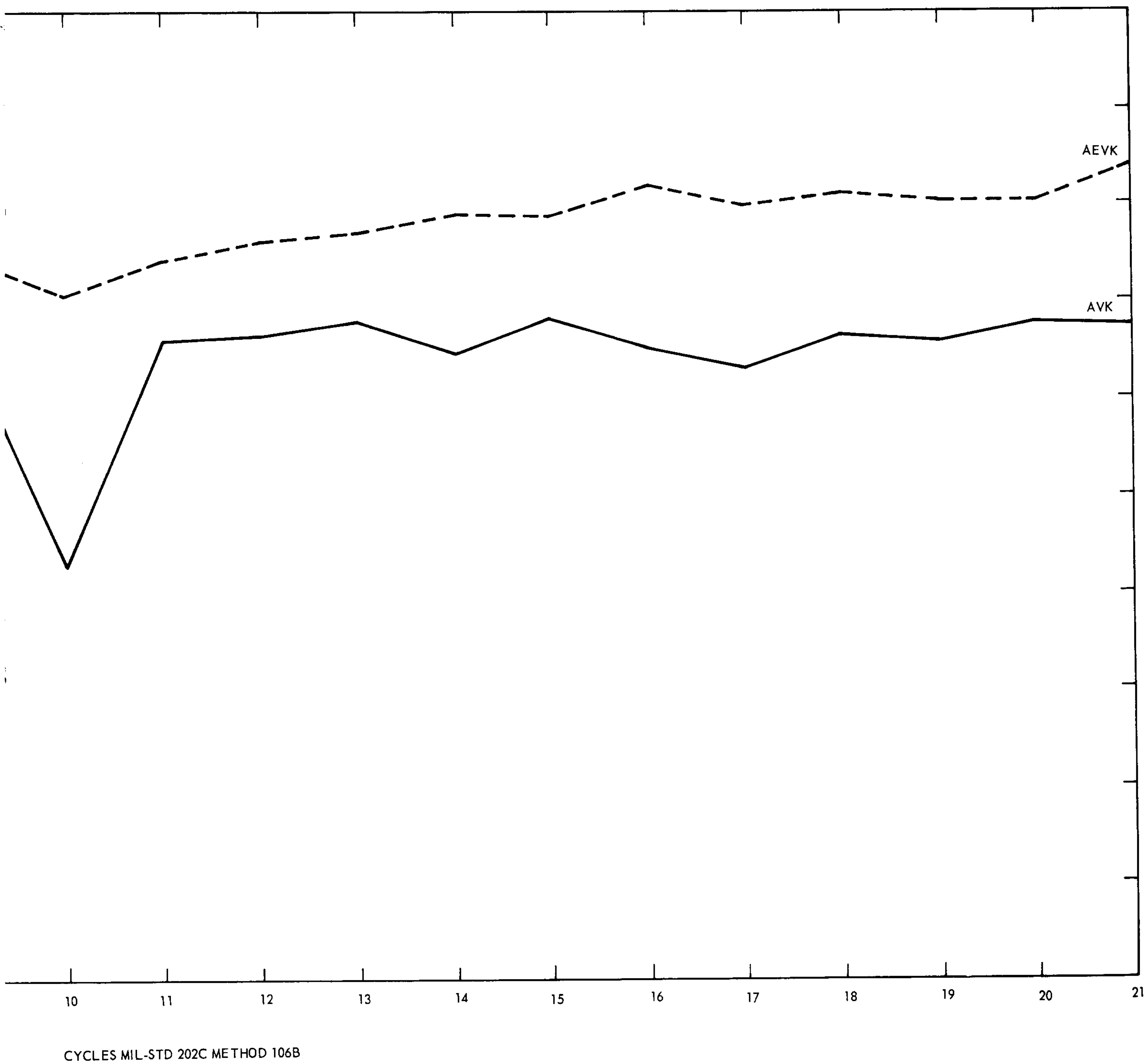



Figure 38. Accelerated Life Test Group VK, MIL-STD 202C Method 106B

2.24 Capacitor, Variable, Ceramic, VC (Phase II)

Visual inspection of the commercial ceramic variable capacitors after 7 months of tropical exposure is summarized here:

JVC - Silver tarnished; ceramic and plastic dirty.

JEVC - Silver tarnished; ceramic and plastic dirty.

SVC - Silver tarnished; considerable evidence of salt and moisture accumulation on ceramic and plastic surfaces.

SEVC - Same as for SVC above.

Figure 39 is a photograph of the jungle-located units with the above-mentioned dirty spots in evidence.

During the installation of the lead-acid batteries the excitation voltage on the capacitor panel of the Phase II components was observed to be depressed below the minimum limits. Investigation determined that leakage current through the 8K isolation resistor was sufficient to reduce the component voltage to less than 10 volts. The VC capacitors were isolated as having developed low insulation resistance; i.e., high leakage current. The extent of degradation was determined by both direct current resistance and "Q" measurements. Correlation was obtained between the methods. Resistance as low as 20,000 ohms was measured. In order to continue the test, it was necessary to put in additional isolation for the VC capacitors only. This additional isolation resistance, 220,000 ohms, reduced the excitation voltage across the VC's to approximately 2 volts.

The cause for this condition is ascribed to the very well known phenomenon of silver migration. Since these components are not sealed from moisture, this result could be expected. The field personnel were instructed to monitor the leakage resistance of these components.

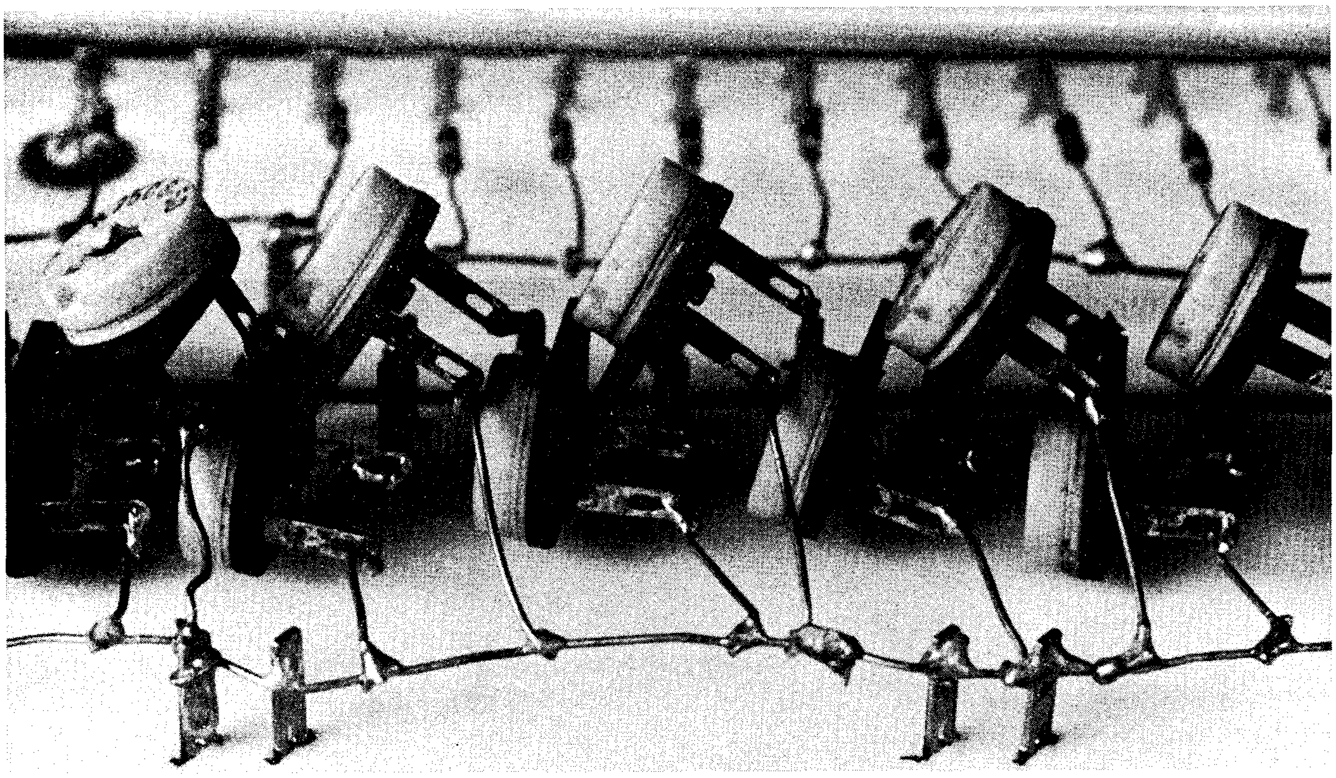
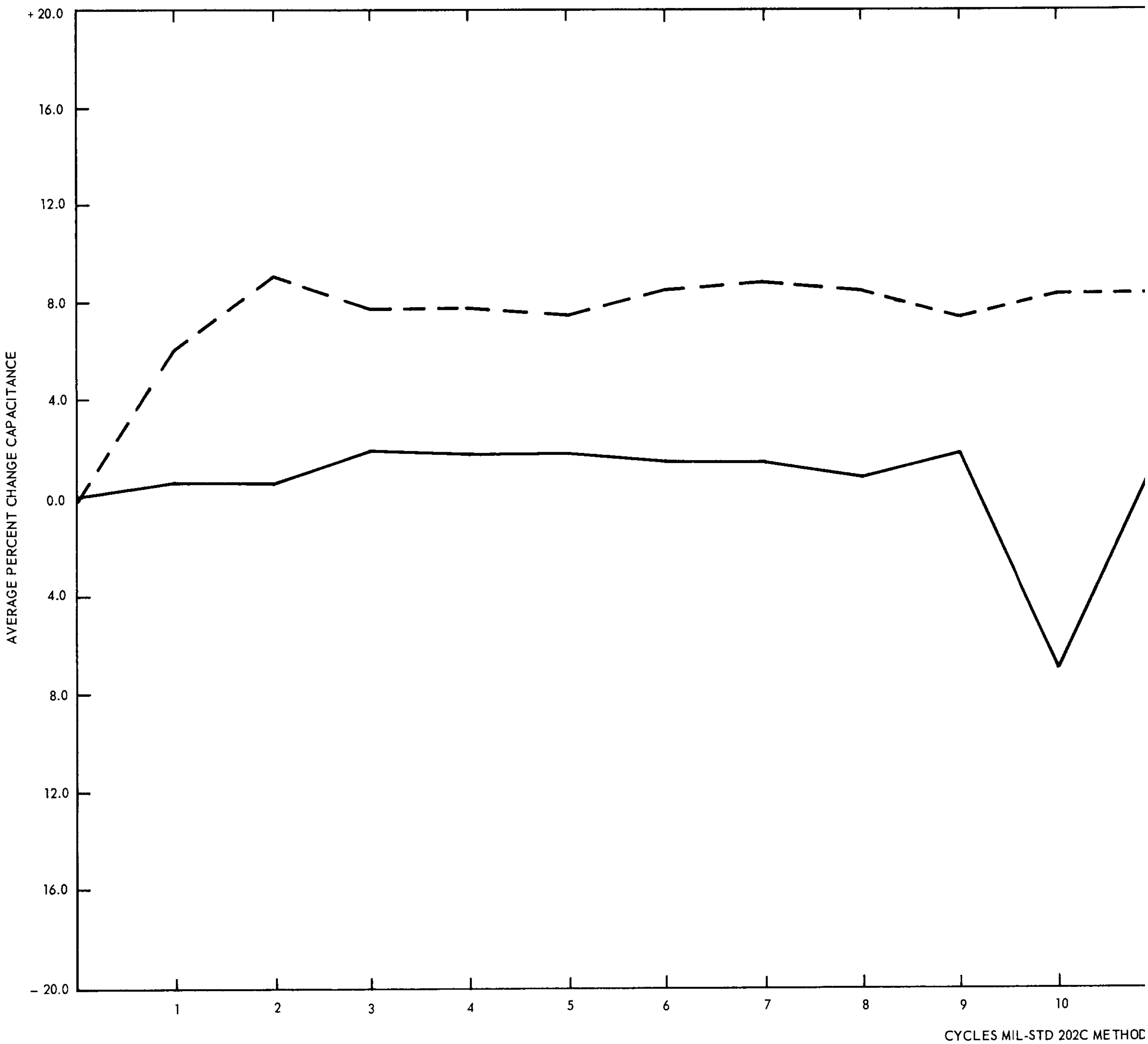


Figure 39. JVC Capacitor, Variable, Ceramic, Dirty Appearance of Ceramic Discs

## Acceleration Stress Test Results

The laboratory stress testing of the variable ceramic capacitor did not yield reliable data owing to the large amount of cable capacitance which was subject to variation due to moisture and physical position changes. No catastrophic failure developed such as observed after 7 months of tropical exposure owing to the limited time span of the test. The processed data for this test are given in table D-9 of appendix D and the average percent change in capacitance is plotted in figure 40.

E5699


+ 20.0
16.0
12.0
8.0
4.0
0.0
4.0
8.0
12.0
16.0
– 20.0
AVERAGE PERCENT CHANGE CAPACITANCE
1
2
3
4
5
6
7
8
9
10
CYCLES MIL-STD 202C METHOD

1

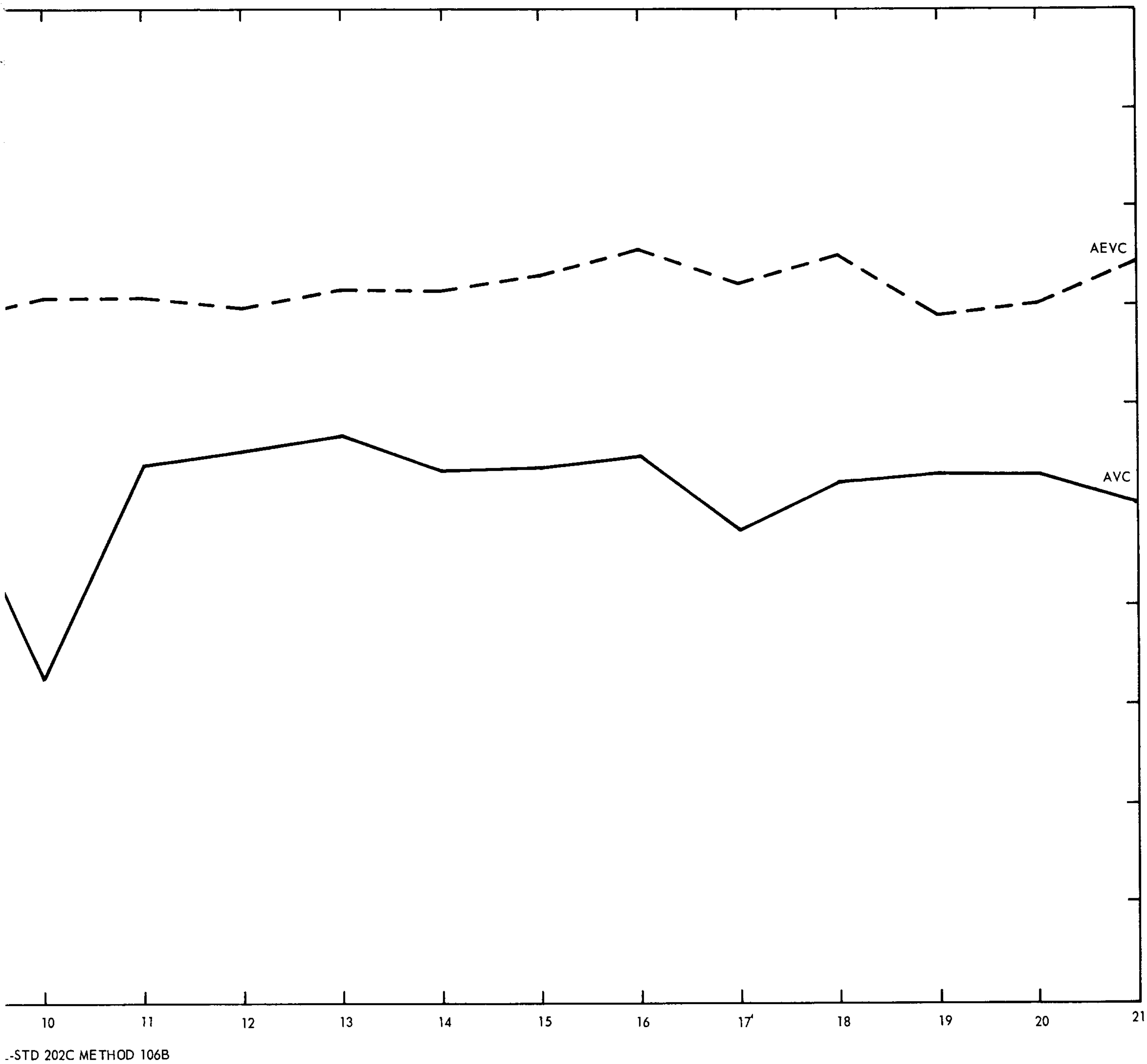



Figure 40. Accelerated Life Test Group VC, MIL-STD 202C Method 106B

2.25 <u>Inductor, Variable, VI (Phase II)</u>

The inspection of these components after 7 months in the tropics revealed only discoloration of the mounting hardware and clouding of the coil impregnating varnish. During the instruction period for the use of the "Q" Meter, a set of data was taken for one lot of these components. The only comparison possible is with the control lot.

| | | |
|---|---|---|
| Canal Zone: | f - 2.67 MHz | Q - 48 to 61 |
| Control: | f - 2.00 MHz | Q - 93 to 101 |

This is an indication of 2:1 increase in losses. (NOTE: The laboratory control units at 2.67 MHz have Q value equal to or greater than the values at 2.00 MHz.)

The value of capacitance required to resonate the inductors in the field appeared to have a greater spread in value than for the inductors in the control group.

Based upon this investigation, plans are going forward to measure these components by "Q" Meter techniques at a nominal frequency of 1.50 MHz. This is an optimum based upon a measured self-resonance of 10.5 MHz for the coil assembly. At 1.50 MHz, the Q and inductance error as read directly on the meter approaches zero. It is felt that this technique will provide more uniform and realistic data for these components.

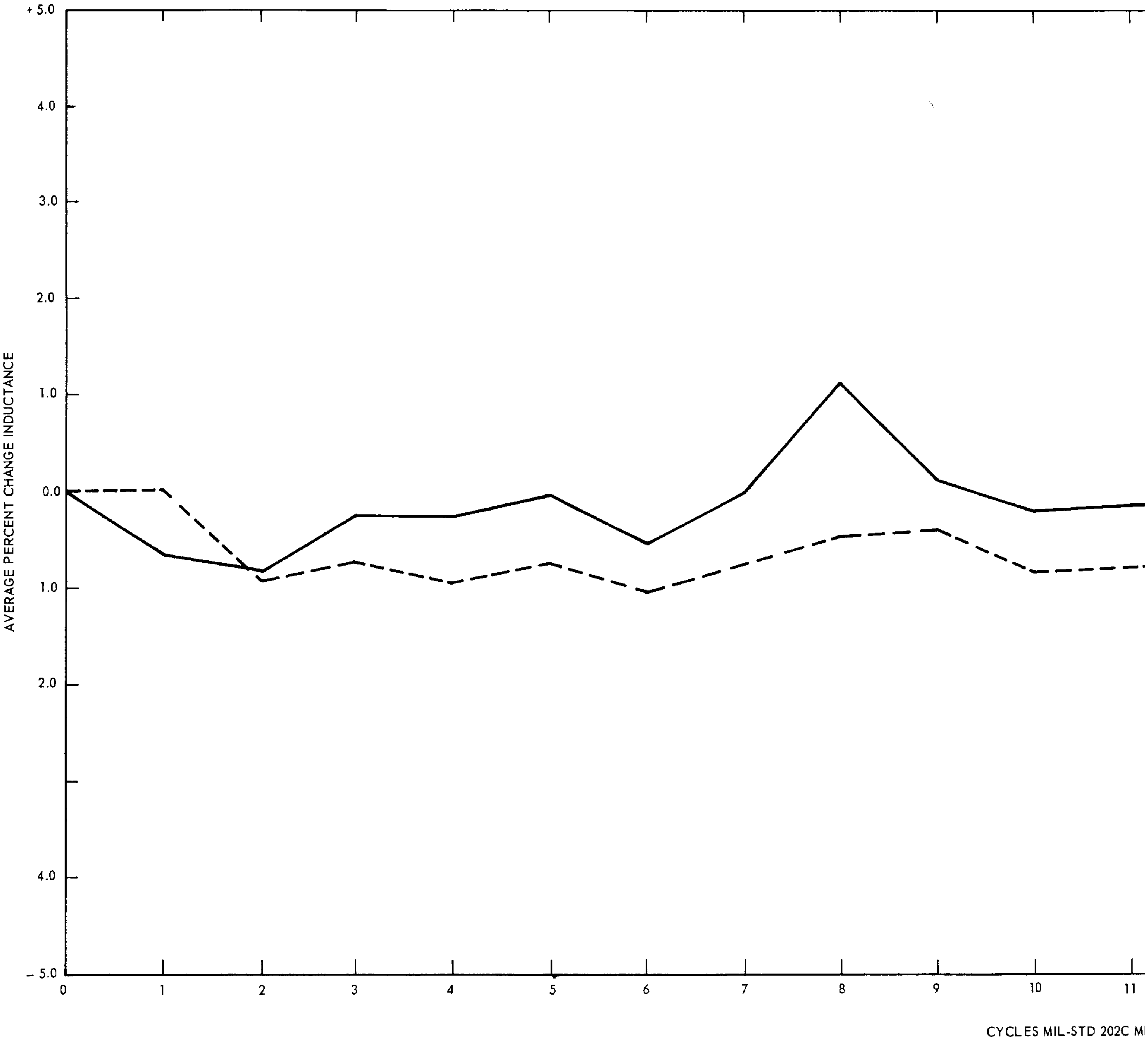
The first conjecture as to the cause of increased loss for these components is that moisture has been absorbed into the plastic impregnant or that the impregnation was incomplete and moisture had been absorbed into the fabric of the wire insulation.

Accelerated Stress Test Results

The variable inductors, VI, when subjected to the MIL-STD-202C, Method 106B temperature and humidity test for 20 cycles exhibited no degradation or failure mechanism other than a slight shift in value during the first few cycles. The comment made regarding 1000 Hz measurement of the WE inductors also applies to the variable inductors VI. The data taken with long leads into the test chamber caused errors which could not be controlled or determined. Therefore the data do not reflect the performance of this component or frequencies normal to its application.

The processed data for this test are given in tables D-10 and D-11 of appendix D. The average percent change in inductance is plotted in figure 41.

E5690



+ 5.0
4.0
3.0
2.0
1.0
0.0
1.0
2.0
4.0
– 5.0
AVERAGE PERCENT CHANGE INDUCTANCE
0
1
2
3
4
5
6
7
8
9
10
11
CYCLES MIL-STD 202C M


1

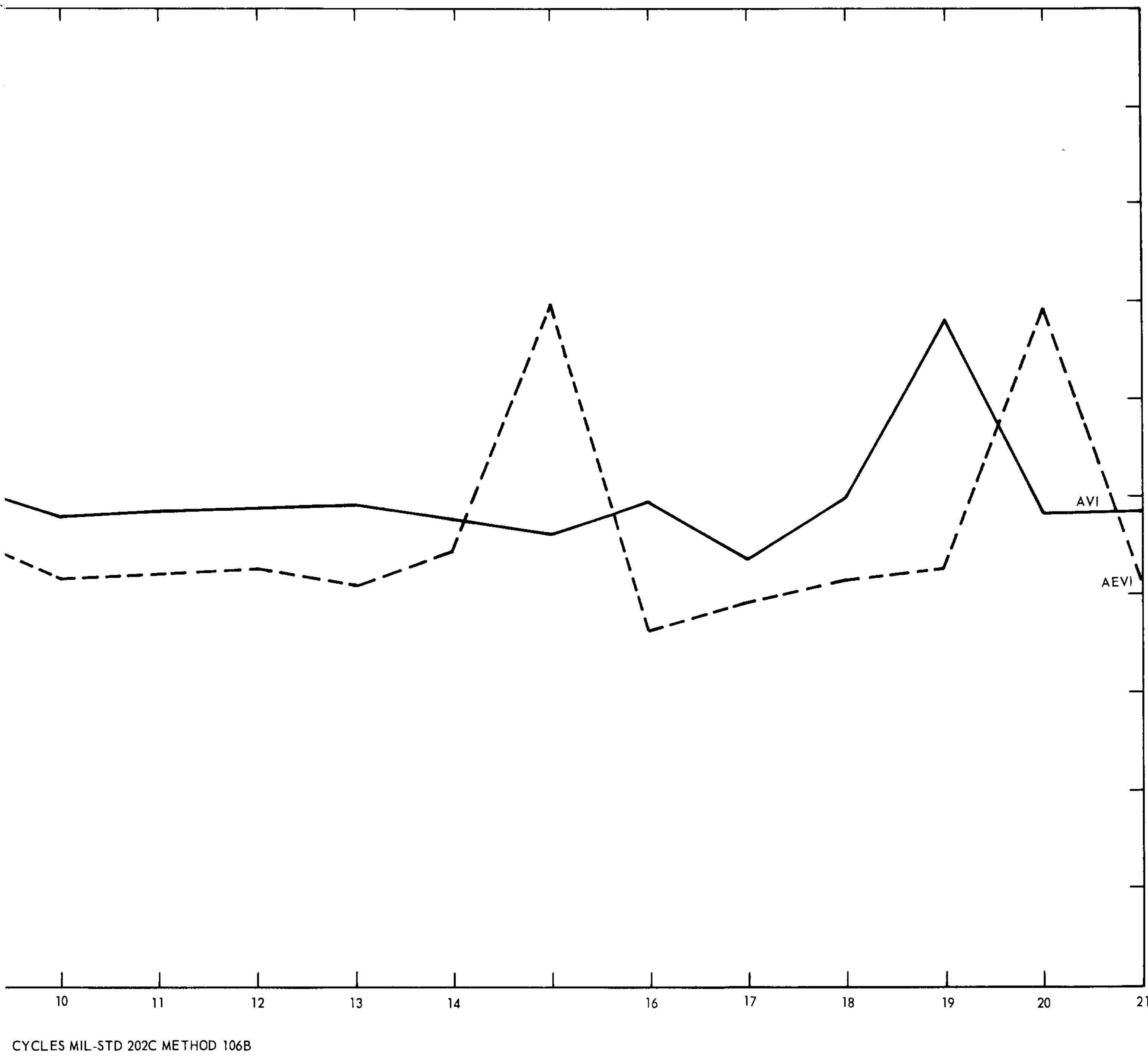



Figure 41. Accelerated Life Test Group VI, MIL-STD 202C Method 106B

## 3. LABORATORY TEST, MIL-STD-202C, METHOD 106B

### 3.1 General

In accordance with the stated guidelines of this program, Melpar completed during this quarter the second laboratory test considered capable of stressing electronic components so as to produce results which correlate with field exposure on an accelerated time scale. The method, equipment, and technique were fully described in the second quarterly report.[10] The component group were those of the second phase of this program; i.e., RO, RL, MF, RJ, VI, VC, TA, CL, KC, and VK as described in the third quarterly report.[11]

The only problem area encountered was in the measurement of the low value components. These were the variable ceramic capacitor, VC; the fixed ceramic capacitor, VK; and the variable inductor, VI. The constraints of not removing the components from the test chamber and energization of one-half of the units during 90 percent or more of the time required a test lead from each component to the test instruments outside the temperature humidity chambers. The distributed capacitance of these leads was observed to change due to movement of the cable assembly and the energization of the terminal boards. An attempt was made to ascertain the distributed capacitance with a control lead, but it was abandoned when the data lacked correlation. One solution would be to use calibrated test leads with the clips being manipulated with sealed gloves as in a "dry box," but this is not possible at present.

The performance of the components was almost without any drastic change, degradation, or failure. The only failure recorded was for one RJ

variable resistor which apparently held sorbed condensate, causing the resistance value to decrease to less than 50 percent. At the end of 7 months of tropical exposure, the same failure has been recorded for more than one of these components. The energized variable ceramic capacitors in the tropics have developed silver migration as a definite failure mechanism which has not been observed in the 20-day laboratory test.

### 3.2 Data Analysis

The data recorded from the laboratory test were processed in the same manner as the field and control data. The previous laboratory test results were compared with the jungle data on a 20:1 scale. It is considered premature at this time to prepare comparison plots since only 7 months of field data are available.

Failure limits for these components have not been established, but are awaiting analysis of both this test and a reasonable amount of field data.

4. DUMMY COMPONENT TEST BOARDS

Two dummy component test boards were exposed in February and immediately showed the effects of the high humidity environment. Figure 42 shows the wiring and testing diagram of the boards, and table 6 gives the data accumulated since February and, in addition, the original calibration data.

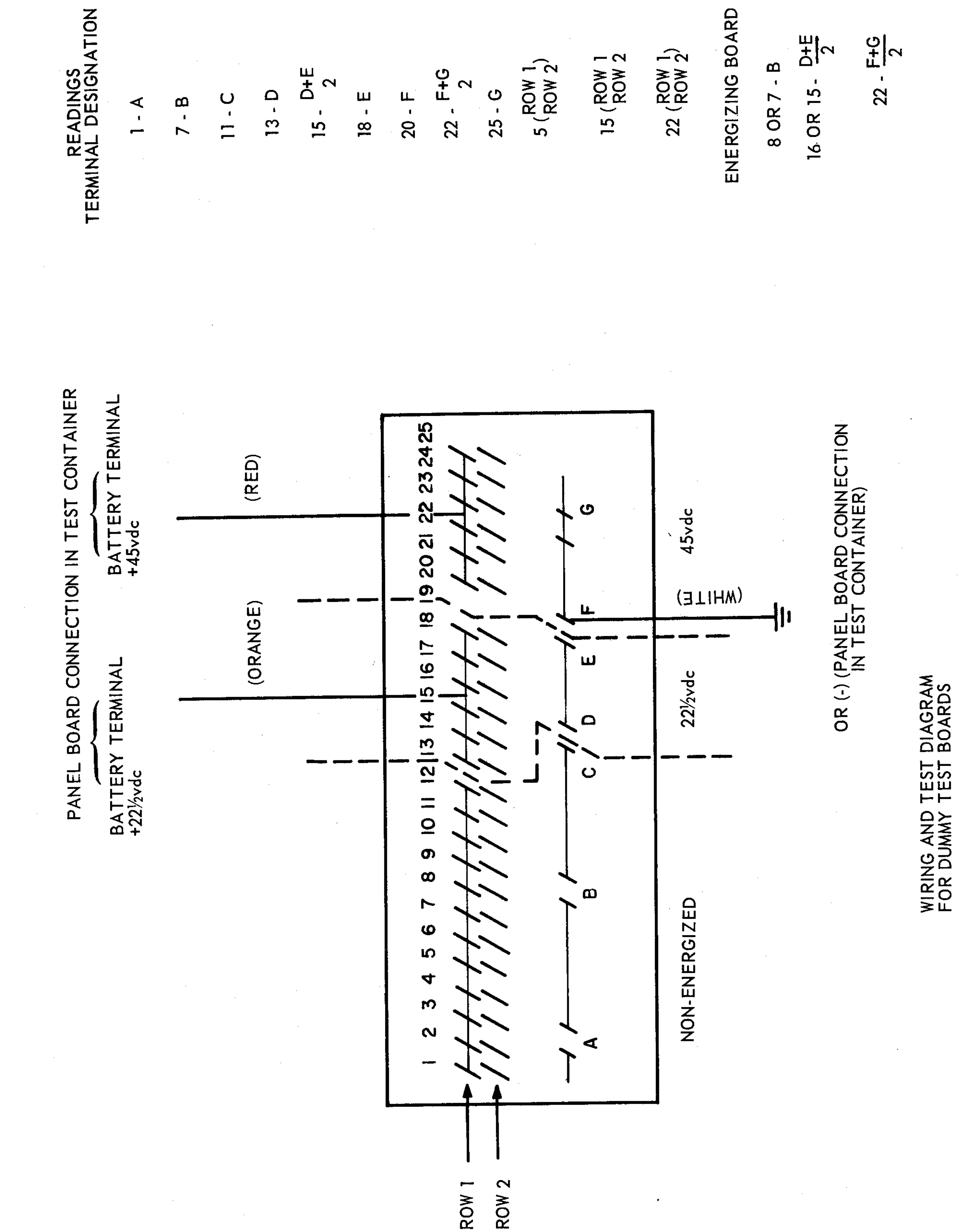



Figure 42. Wiring and Test Diagram for Dummy Test Boards

TABLE 6. DUMMY COMPONENT TEST BOARD INSULATION RES

Insulation Resistance, Kilo-Mègohms at 5

| Reading* | Laboratory Calibration Shore | Laboratory Calibration Jungle | 2/14/66 Shore | 2/14/66 Jungle | 3/7/66 Shore | 3/7/66 Jungle |
|---|---|---|---|---|---|---|
| 1 - A | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 7 - B | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 11 - C | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 13 - D | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 15 - $\frac{D+E}{2}$ | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 18 - E | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 20 - F | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 22 - $\frac{F+G}{2}$ | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 25 - G | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 5 (Row 1) (Row 2) | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 15 (Row 1) (Row 2) | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 22 (Row 1) (Row 2) | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| | | | | | Energizing Boards | |
| 8 or 7 - B | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 16 or 15 - $\frac{D+E}{2}$ | 100 | 100 | > 10 | > 10 | > 10 | > 10 |
| 22 - $\frac{F+G}{2}$ | 100 | 100 | > 10 | > 10 | > 10 | > 10 |

* Terminal-to-terminal insulation resistance per arrangement given in figure 42.

ARD INSULATION RESISTANCE Kilo-Megohms

Kilo-Megohms at 50 Volts (dc)

| Field | | | | | | |
|---|---|---|---|---|---|---|
| 3/7/66 Jungle | 3/28/66 Shore | 3/28/66 Jungle | 4/20/66 Shore | 4/14/66 Jungle | 5/25/66 Shore | 5/25/66 Jungle |
| > 10 | > 10 | > 10 | < 10 | > 10 | > 1 | < 10 |
| > 10 | > 10 | > 10 | < 10 | < 10 | > 1 | < 10 |
| > 10 | > 10 | > 10 | 1 | > 10 | < 1 | > 1 |
| > 10 | > 10 | > 10 | < 10 | > 10 | < 10 | < 10 |
| > 10 | > 10 | > 10 | < 10 | > 10 | < 10 | 10 |
| > 10 | > 10 | > 10 | < 10 | > 10 | < 10 | 10 |
| > 10 | > 10 | > 10 | < 10 | < 10 | < 10 | < 10 |
| > 10 | > 10 | > 10 | < 10 | > 10 | < 10 | 10 |
| > 10 | > 10 | > 10 | < 10 | > 10 | < 10 | 10 |
| > 10 | > 10 | > 10 | < 10 | > 10 | 10 | 10 |
| > 10 | > 10 | > 10 | < 10 | > 10 | 10 | 10 |
| > 10 | > 10 | > 10 | < 10 | > 10 | < 10 | 10 |
| gizing Boards | | | | | | |
| > 10 | > 1 | > 1 | < 10 | > 1 | 1 | > 1 |
| > 10 | > 1 | > 1 | > 1 | < 10 | < 1 | 1 |
| > 10 | > 1 | > 1 | > 1 | > 1 | 0.1 | 0.1 |

2

## 5. CONCLUSIONS

The following conclusions result from the effort on this contract for the fourth quarter and the year.

1. The value change for the 23-month tropically exposed components has during this year slowed and or stabilized except for catastrophic failures. The components exposed at the shore site evidence greater degradation than the same components exposed at the jungle site. The components being excited with direct current potential evidence greater degradation than the same unexcited components.

2. The majority of catastrophic failures are charged to the effects of corrosion from the deposition of salts present at the shore site. Numerous leads have broken due to corrosion, and at present, all component leads exhibit this action to various degrees. Solder joints and the gold-plated terminals have not been immune to corrosion; i.e., replacement of buss wire and the resoldering of wrapped connections have been common and necessary during the past year.

3. The terminal board decontamination procedure has reduced the data excursions previously reported and ascribed to the shunting of the terminal board by a salt water film. The shunting has been sufficiently reduced so that the measured data reflect the degree of the degradation process. This decontamination process does not eliminate shunting over the component outer surface, and with time, the data from the higher impedance units will reflect this deposition.

4. Two weeks of forced drying yielded value improvement for almost all of the 23-month components. The incremental recovery for the film-type

components was rather rapid, whereas for the bulk-type components the 2-week period may not have been sufficiently long to obtain a state of equilibrium.

5. The MIL-STD-202C Method 106B Laboratory Stress Exposure test for samples from the Phase I component group yielded correlation with the jungle-exposed bulk type components such as composition resistors, mica capacitors, and Mylar capacitors. It is conjectured that similar correlation could have been obtained with shore-exposed components if the board decontamination procedure had been initiated early in the program. This is based upon upon current data values which reflect similar average values for the jungle and shore samples.

6. The MIL-STD-202C, Method 106B Laboratory Stress Exposure test for samples from the Phase II component groups predicted a possible area of failure. One variable resistor, type RJ, was observed to decrease in value to -75 percent of its initial value. A similar failure has been observed for this component after months of exposure in the field. The failure mechanism of silver migration did not develop in 20 days in the laboratory, but did in the field exposure for the variable capacitor type VC.

7. The climatic environment in the Canal Zone is considerably more stable than the Method 106B test cycle. This is considered as one of the main reasons for lack of correlation for certain components.

## 6. PROGRAM FOR THE NEXT INTERVAL

The program for the first quarter of the continuation contract DA-28-043-AMC-02222 (E) will concentrate on the development of a correlatable laboratory test. The specified MIL-STD-202C Method 106B, which has given limited correlation, will be set aside for a fixed temperature and humidity test with salt spray added. This is based upon the conclusion that moisture is the primary stress or degradation element in the tropical exposure. The effect of moisture in combination with salt at a beach site yields results of moisture absorption into the bulk materials and moisture and salt deposition on the surfaces for corrosion of metals and conductive shunting.

The first phase will be the evaluation of the results reported from the previous study in this area by Battelle Memorial Institute. These results, in combination with the capabilities of the salt fog chamber available at Melpar will determine the initial stress environment. Based upon results to date, both field and laboratory, it is felt that temperature need not be cycled and that relative humidity should be as high as possible. When salt is added to the environment, the humidity should not be so high as to cause the salt and corrosion products to be washed away by condensate. The only components scheduled for failure analysis and investigation out of the Phase I lot are the microminiature modules. The leads to these modules have suffered considerably from the effects of corrosion and it was decided to terminate their continued exposure. At the Agency's request, the remaining individual components remain exposed to the tropical environment.

The method of measuring the inductance and "Q" of the small inductors, type VI, will be changed from 1000 Hz on an impedance bridge to 1.5 MHz on a "Q" meter. This will yield data having a 1:1 correlation with the components normal circuit application.

No inspection trips are planned.

## 7. IDENTIFICATION OF KEY PERSONNEL

The following key technical personnel, whose résumés are on file at the agency have spent the following time on the program during the contract period of 1 June 1966 through May 31, 1966, and the additional time required to prepare, edit, and publish this report.

| | Hours |
|---|---|
| A. A. Fini | 427 |
| W. B. Morrow | 855 |
| B. H. Dennison | 969 |

## 8. REFERENCES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3. Report No. 3 "Tropical Service Life of Electronic Parts and Materials," Third Quarterly Progress Report, Contract No. DA-36-039-AMC-02241 (E), USAERDL, Ft. Monmouth, New Jersey.

4. Report No. 4 "Tropical Service Life of Electronic Parts and Materials," Annual Interim Report, Contract No. DA-36-039-AMC-02241 (E), USAERDL, Fort Monmouth, New Jersey.

5. Report No. 5 "Tropical Service Life of Electronic Parts and Materials," Fourth Quarterly Progress Report, Contract No. DA-36-039-AMC-02241 (E), USAERDL, Ft. Monmouth, New Jersey.

6. Report No. 6 "Tropical Service Life of Electronic Parts and Materials," Fifth Quarterly Progress Report, Contract No. DA-36-039-AMC-02241 (E), USAERDL, Ft. Monmouth, New Jersey.

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15. "Laboratory Test Procedures for Predicting the Tropical Service Life of Electronic Components and Materials," Fourth Quarterly Progress Report, Contract No. DA-36-039-SC-64518, Squier Signal Laboratory, Ft. Monmouth, New Jersey.

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# APPENDIX A

# ABBREVIATIONS, DEFINITIONS, AND COMPONENT IDENTITY

APPENDIX A

ABBREVIATIONS, DEFINITIONS, AND COMPONENT IDENTITY

1. Electronic Components, Sample Lot Identity

The first letter of both the three- and four-letter combinations designates the location or specific stress test.

These letters and their identifications are:

A - MIL-STD-202C Method 106B 20 day, Temperature Humidity Exposure

B - 20 day one percent salt fog at 60°C exposure

C - Control - Laboratory, Melpar, Inc.

J - Jungle - Lat. 9° 22' 47" N
Long. 79° 51' 49"W

S - Shore - Lat. 9° 24' 09" N
Long. 79° 51' 49"W

The second letter of the four-letter combinations - E - denotes "Energized" component lot. For example:

JERC - Jungle Energized Resistor, Composition

If the component lot is not energized, only three letters are used:

JRC - Jungle (unenergized) Resistor, Composition

The last two letters of both the three- and four-letter combinations identify the component type. The asterisks are used to identify the date the components were put on test (see footnote). The component idenfification letters are:

CK (*) Capacitor, fixed, ceramic, type CK12AX101K, MIL-C-11015

CL (**) Capacitor, fixed, tantalum pentoxide dielectric, liquid electrolyte, type CL24BJ4R5UP3, MIL-C-3965/2A

*Denotes component put on exposure at jungle and seashore beginning June 1964.

**Denotes components put on exposure at jungle and seashore beginning September 1965.

| | |
|---|---|
| CM (*) | Capacitor, fixed, mica, type CM06222J03, MIL-C-5 |
| CS (*) | Capacitor, fixed, tantalum, solid electrolyte, type CS13AF010K MIL-C-26655 |
| CT (*) | Capacitor, fixed, Mylar, type CTM104VAK, MIL-C-27287 |
| KC (**) | Capacitor, fixed, ceramic, multiplate construction. Commercial type 262C-067103X9101B |
| MC (*) | Capacitor, fixed, ceramic, micromodule assembly |
| MF (**) | Resistor, fixed, metal film, type RN60C1002F, MIL-R-10509E |
| MR (*) | Resistor, fixed, micromodule assembly |
| RC (*) | Resistor, fixed, composition, type RC07GF103J, MIL-R-11 |
| RJ (**) | Resistor, variable, cermet film, type RJ12, Commericial specification 3052L |
| RL (**) | Resistor, fixed, tin oxide film, type RL07AD103J, MIL-R-22684 |
| RN (*) | Resistor, fixed, carbon film, type RN55D1003F, MIL-R-10509 |
| RO (**) | Resistor, fixed, composition, insulated, type RC08GF472J |
| RW (*) | Resistor, fixed, wire wound, type RW69V901, MIL-R-26 |
| TA (**) | Capacitor, fixed, tantalum pentoxide dielectric, solid electrotype, type TAM 106M025P5C (commercial) |
| VC (**) | Capacitor, variable, ceramic, type 557-000-24R (commercial) |
| VI (**) | Inductor, variable, type X-2060-5 (commercial) |
| VK (**) | Capacitor, fixed, ceramic, type CK05CW221K, MIL-C-11015 |
| WE (*) | Inductor, fixed, ferrite, type WEE-39 (commercial) |

2. <u>Cables, Telephone, Power, and Radio Frequency</u>

(June 1964)

WD-1, Twisted pair field wire, polyethylene insulation with Nylon jacket, stranded conductor, steel reinforced.

WD-1, Modified twisted pair field wire, hard polyethylene with no jacket, stranded conductor, steel reinforced.

WF-16, Field wire, four conductor, two twisted pairs, each pair parallel laid, conductors stranded cadmium-copper.

RG330U, r-f cable, miniature coaxial, foamed polyethylene dielectric with high density polyethylene jacket.

RG58C/U, r-f cable, miniature coaxial, solid polyethylene dielectric with type II-A jacket, per MIL-C-17.

(September 1965)

Tropical jungle cable, developed per contract DA 36-039-AMC-02168(E), 2-conductor cable, solid alloy PD 135 conductor with propylene copolymer insulation.

RCA 012 Power cable, silicone rubber insulation, arctic neoprene jacket.

RCA 013 Power cable, butyl rubber insulation, arctic neoprene jacket.

WM 130 Multiconductor field telephone cable, per MIL-C-55036, 26 pair cable.

US 10-RG 326, coaxial cable, perforated Teflon tape, insulated polyurethane jacket.

RG-8A/U, low density polyethylene dielectric core with nitrile rubber-vinyl chloride jacket, per MIL-C-17.

RG-213/U construction, except ester-type urethane jacket (Formula C).

RG-213/U construction, except ether-type urethane jacket, LD-387, PP-20395.

RG-213/U construction, except ethylene copolymer jacket: i.e., ethylene plus one polar comonomer (DXDF 1211, PP-20423).

RG-213/U construction, except ester-type urethane jacket. Same as above except different manufacturer (Urethane Estane 58064).

RG-213/U, construction, except ethylene copolymer jacket, Alathan 2000, BK 30, TW-6.

RG-9/U, low density polyethylene dielectric core with nitrile rubber-vinyl chloride jacket, per MIL-C-17.

Hookup wires, 6145-K90-5660, 6144-K90-5638, and 6145-635-2820, per MIL-W-76A MW-C-20(10)U.

3. <u>Connectors and Caps</u>

(June 1964)

UG260D/U - Connector for RG330/U

UG88E/U - Connector for RG58C/U

CU282/U - Caps for UG260D/U and UG88E/U

(September 1965)

UG-23 Coaxial connector

UG-21 Coaxial connector

MX-913 Coaxial connector cap

6950 Coaxial connector cap

Twenty-six pair "hermaphrodite" connector per SCL-6024

# APPENDIX B

## DATA SUMMARIES FOR PHASE I COMPONENTS

## JUNE 1964 TO JUNE 1966

EXPLANATION OF TERMS

% CHANGE is $\frac{X_i - X_o}{X_o} \times 100$,

where $X_o$ = initial value, resistance, capacitance or Q

$X_i$ = value measured at data taking (internal)

LIMIT is the agreed tolerance limit based upon the component specifications and coefficients.

AVE % CH is the arithmetic average of the % CHANGE value for the sample lot, excluding catastrophic failures.

MEAN VAL is the MEAN or $\overline{X}$ value of the sample lot, excluding catastrophic failures.

STD DEV is $\sqrt{\sum \frac{f_i (X_i)^2}{N} - (\overline{X})^2}$

Standard deviation $\sigma$ is in units of measure the same as those for the component.

% VAR is the PERCENT VARIANCE $\frac{\sigma}{\overline{X}} \times 100$

TEMP/RH % is temperature (°F) and relative humidity (%) observed at the time the measurements were recorded.

FAIL D corresponds to the number of components in the lot whose value has exceeded the LIMIT but not exceeded twice the LIMIT with respect to the number of valid-data components.

FAIL C corresponds to the number of components in the lot whose value has exceeded TWICE the LIMIT with respect to the number of valid-data components.

## TABLE B-1. DATA SUMMARY, CARBON COMPOSITION RESISTORS (RC)

| TYPE RC | | | | RESISTOR SUMMARY--% CHANGE | | | | | | | LIMIT | | 11.50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JRC | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .52 | 1.21 | 1.87 | 3.95 | 4.84 | 5.45 | 5.64 | 5.71 | 5.56 | 5.71 | 5.75 | 5.19 |
| MEAN VAL | 10.022 | 10.074 | 10.143 | 10.210 | 10.418 | 10.507 | 10.568 | 10.587 | 10.594 | 10.579 | 10.594 | 10.598 | 10.542 |
| STD DEV | .107 | .152 | .084 | .107 | .129 | .148 | .115 | .101 | .093 | .157 | .164 | .117 | .098 |
| % VAR | 1.07 | 1.51 | .83 | 1.05 | 1.24 | 1.41 | 1.09 | .95 | .88 | 1.48 | 1.55 | 1.10 | .93 |
| TEMP/RH% | | 80/88 | 85/70 | 83/72 | 80/88 | 77/00 | 79/92 | 88/79 | 83/83 | 79/86 | 82/88 | 73/00 | 86/64 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JERC | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .59 | 1.23 | 2.01 | 4.00 | 4.86 | 5.45 | 5.62 | 5.67 | 5.45 | 5.60 | 5.59 | 5.04 |
| MEAN VAL | 10.020 | 10.079 | 10.143 | 10.222 | 10.421 | 10.507 | 10.566 | 10.583 | 10.587 | 10.566 | 10.581 | 10.580 | 10.524 |
| STD DEV | .098 | .141 | .152 | .064 | .076 | .139 | .128 | .083 | .154 | .122 | .135 | .072 | .156 |
| % VAR | .98 | 1.40 | 1.50 | .63 | .73 | 1.32 | 1.21 | .78 | 1.45 | 1.15 | 1.28 | .68 | 1.48 |
| TEMP/RH% | | 82/89 | 84/81 | 79/86 | 81/74 | 78/85 | 81/84 | 88/74 | 84/78 | 80/88 | 82/89 | 74/00 | 89/60 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SRC | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | .70 | .97 | 1.82 | 3.43 | 4.18 | 4.54 | 4.68 | 4.62 | 4.56 | 4.70 | 4.59 | 4.34 |
| MEAN VAL | 9.987 | 10.057 | 10.084 | 10.169 | 10.330 | 10.405 | 10.440 | 10.455 | 10.449 | 10.442 | 10.456 | 10.446 | 10.420 |
| STD DEV | .119 | .111 | .075 | .088 | .094 | .089 | .123 | .116 | .076 | .135 | .136 | .101 | .138 |
| % VAR | 1.19 | 1.10 | .74 | .87 | .91 | .86 | 1.18 | 1.11 | .73 | 1.29 | 1.30 | .97 | 1.32 |
| TEMP/RH% | | 78/89 | 87/62 | 85/74 | 85/72 | 84/72 | 84/72 | 91/72 | 85/75 | 76/90 | 82/92 | 78/90 | 79/84 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SERC | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | .58 | .92 | 1.63 | 3.32 | 4.00 | 4.35 | 4.46 | 4.42 | 4.42 | 4.51 | 4.39 | 4.03 |
| MEAN VAL | 9.986 | 10.044 | 10.078 | 10.149 | 10.317 | 10.386 | 10.420 | 10.432 | 10.428 | 10.428 | 10.437 | 10.425 | 10.389 |
| STD DEV | .133 | .125 | .118 | .152 | .137 | .078 | .143 | .118 | .062 | .125 | .104 | .081 | .134 |
| % VAR | 1.33 | 1.24 | 1.17 | 1.50 | 1.33 | .75 | 1.37 | 1.13 | .59 | 1.20 | 1.00 | .78 | 1.29 |
| TEMP/RH% | | 79/82 | 87/69 | 84/80 | 84/72 | 85/64 | 82/82 | 89/79 | 86/70 | 77/89 | 83/89 | 78/90 | 82/76 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CRC | | 02/27/64 | 06/10/64 | 07/13/64 | 07/28/64 | 08/18/64 | 09/09/64 | 09/29/64 | 10/26/64 | 11/24/64 | 12/15/64 | 01/05/65 | 01/22/65 |
| AVE % CH | | .13- | 1.32 | 1.92 | 2.03 | 2.07 | 2.27 | 1.96 | .88 | .47 | .31 | .38 | .04- |
| MEAN VAL | 9.917 | 9.903 | 10.048 | 10.106 | 10.118 | 10.122 | 10.142 | 10.111 | 10.004 | 9.963 | 9.947 | 9.955 | 9.912 |
| STD DEV | .086 | .134 | .078 | .161 | .205 | .093 | .131 | .120 | .126 | .103 | .138 | .084 | .137 |
| % VAR | .87 | 1.35 | .78 | 1.59 | 2.03 | .92 | 1.29 | 1.19 | 1.26 | 1.03 | 1.39 | .84 | 1.38 |
| TEMP/RH% | | 74/15 | 80/60 | 77/60 | 74/68 | 76/66 | 78/60 | 83/56 | 75/40 | 81/26 | 72/25 | 78/28 | 74/29 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-1. DATA SUMMARY, CARBON COMPOSITION RESISTORS (RC) (Cont.)

TYPE RC — RESISTOR SUMMARY--% CHANGE — LIMIT 11.50

| TYPE RC | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JRC | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | 4.76 | 5.05 | 4.91 | 4.57 | 4.21 | 4.43 | 5.53 | 5.82 | 5.38 | 5.92 | 6.04 | 5.74 |
| MEAN VAL | 10.499 | 10.528 | 10.514 | 10.480 | 10.443 | 10.465 | 10.576 | 10.605 | 10.561 | 10.615 | 10.627 | 10.598 |
| STD DEV | .100 | .159 | .146 | .150 | .155 | .153 | .125 | .134 | .153 | .143 | .140 | .092 |
| % VAR | .95 | 1.51 | 1.39 | 1.43 | 1.48 | 1.46 | 1.18 | 1.26 | 1.45 | 1.35 | 1.32 | .87 |
| TEMP/RH% | 83/66 | 81/76 | 78/80 | 79/82 | 80/88 | 84/73 | 80/78 | 80/96 | 88/66 | 76/96 | 82/83 | 82/80 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JERC | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | 4.67 | 4.92 | 4.83 | 4.53 | 4.19 | 4.39 | 5.47 | 5.75 | 5.33 | 5.82 | 5.93 | 5.61 |
| MEAN VAL | 10.487 | 10.513 | 10.504 | 10.474 | 10.439 | 10.460 | 10.568 | 10.596 | 10.554 | 10.603 | 10.614 | 10.582 |
| STD DEV | .139 | .145 | .119 | .087 | .154 | .111 | .140 | .066 | .091 | .076 | .145 | .089 |
| % VAR | 1.33 | 1.38 | 1.13 | .83 | 1.48 | 1.06 | 1.32 | .62 | .86 | .72 | 1.37 | .84 |
| TEMP/RH% | 84/61 | 80/76 | 81/72 | 80/80 | 81/88 | 85/69 | 81/95 | 78/96 | 87/66 | 77/96 | 80/92 | 82/80 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SRC | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | 4.07 | 4.12 | 4.40 | 4.32 | 4.16 | 4.05 | 4.61 | .04- | 4.43 | 4.63 | 3.81 | 4.06 |
| MEAN VAL | 10.394 | 10.399 | 10.426 | 10.419 | 10.403 | 10.391 | 10.448 | 9.982 | 10.430 | 10.449 | 10.367 | 10.393 |
| STD DEV | .057 | .104 | .148 | .083 | .103 | .141 | .110 | .583 | .090 | .135 | .161 | .102 |
| % VAR | .55 | 1.00 | 1.42 | .80 | .99 | 1.36 | 1.05 | 5.84 | .86 | 1.29 | 1.55 | .98 |
| TEMP/RH% | 77/89 | 79/00 | 78/82 | 82/85 | 81/77 | 82/76 | 86/66 | 87/76 | 85/72 | 85/66 | 86/61 | 77/98 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 2/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SERC | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | 3.86 | 4.02 | 4.34 | 4.07 | 3.93 | 3.76 | 4.66 | 4.03 | 4.24 | 4.10 | 4.59 | 4.44 |
| MEAN VAL | 10.371 | 10.388 | 10.419 | 10.393 | 10.379 | 10.362 | 10.451 | 10.388 | 10.409 | 10.396 | 10.444 | 10.429 |
| STD DEV | .148 | .127 | .135 | .097 | .115 | .122 | .167 | .191 | .147 | .101 | .135 | .146 |
| % VAR | 1.43 | 1.22 | 1.30 | .93 | 1.11 | 1.18 | 1.60 | 1.84 | 1.41 | .97 | 1.29 | 1.40 |
| TEMP/RH% | 78/74 | 80/90 | 80/74 | 83/80 | 83/70 | 85/67 | 86/74 | 89/71 | 84/74 | 82/76 | 85/60 | 81/90 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CRC | 02/19/65 | 03/18/65 | 04/10/65 | 06/18/65 | 07/15/65 | 08/16/65 | 09/08/65 | 09/17/65 | 10/07/65 | 10/27/65 | 11/11/65 | 12/07/65 |
| AVE % CH | .10- | .25- | .03- | 1.87 | 2.43 | 2.72 | 2.70 | 2.80 | 2.25 | 1.73 | 1.10 | .15 |
| MEAN VAL | 9.907 | 9.892 | 9.913 | 10.102 | 10.158 | 10.187 | 10.185 | 10.195 | 10.140 | 10.088 | 10.025 | 9.932 |
| STD DEV | .132 | .123 | .160 | .102 | .129 | .104 | .082 | .082 | .121 | .149 | .157 | .114 |
| % VAR | 1.33 | 1.24 | 1.61 | 1.01 | 1.27 | 1.02 | .81 | .80 | 1.19 | 1.48 | 1.57 | 1.15 |
| TEMP/RH% | 72/20 | 79/29 | 78/34 | 72/59 | 73/62 | 70/65 | 73/64 | 72/72 | 76/29 | 75/32 | 82/34 | 99/22 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-1. DATA SUMMARY, CARBON COMPOSITION RESISTORS (RC) (Cont.)

TYPE RC — RESISTOR SUMMARY--% CHANGE — LIMIT 11.50

| JRC | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 5.78 | 6.00 | 6.27 | 5.61 | 5.12 | 5.02 | 4.63 | 4.64 | 5.59 | 2.21 |
| MEAN VAL | 10.601 | 10.623 | 10.650 | 10.584 | 10.535 | 10.525 | 10.486 | 10.487 | 10.582 | 10.243 |
| STD DEV | .134 | .117 | .133 | .092 | .103 | .130 | .096 | .087 | .101 | .160 |
| % VAR | 1.26 | 1.10 | 1.25 | .87 | .98 | 1.24 | .92 | .83 | .95 | 1.56 |
| TEMP/RH% | 76/98 | 76/94 | 85/70 | 82/78 | 88/56 | 86/64 | 82/76 | 89/56 | 84/66 | 72/47 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **JERC** | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | 5.72 | 5.77 | 6.11 | 5.42 | 4.99 | 4.86 | 4.57 | 4.57 | 5.49 | 2.22 |
| MEAN VAL | 10.593 | 10.597 | 10.632 | 10.562 | 10.520 | 10.507 | 10.478 | 10.478 | 10.570 | 10.242 |
| STD DEV | .146 | .157 | .118 | .159 | .147 | .143 | .081 | .115 | .101 | .096 |
| % VAR | 1.38 | 1.48 | 1.11 | 1.51 | 1.40 | 1.36 | .77 | 1.10 | .96 | .94 |
| TEMP/RH% | 76/98 | 78/84 | 84/70 | 84/74 | 88/56 | 86/62 | 83/72 | 89/56 | 84/64 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **SRC** | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | 4.43 | 4.52 | 5.02 | 4.49 | 4.36 | 4.34 | 4.51 | 4.53 | 5.20 | 1.68 |
| MEAN VAL | 10.429 | 10.439 | 10.488 | 10.436 | 10.423 | 10.421 | 10.438 | 10.440 | 10.506 | 10.155 |
| STD DEV | .137 | .107 | .153 | .101 | .122 | .088 | .119 | .098 | .199 | .123 |
| % VAR | 1.31 | 1.03 | 1.46 | .97 | 1.17 | .84 | 1.14 | .94 | 1.89 | 1.21 |
| TEMP/RH% | 80/86 | 74/92 | 86/64 | 85/72 | 88/56 | 84/64 | 85/66 | 88/70 | 86/72 | 66/50 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **SERC** | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | 4.63 | 4.88 | 5.17 | 5.87 | 4.37 | 4.92 | 5.22 | 5.29 | 5.85 | 1.55 |
| MEAN VAL | 10.449 | 10.473 | 10.503 | 10.571 | 10.422 | 10.477 | 10.506 | 10.513 | 10.569 | 10.144 |
| STD DEV | .070 | .183 | .157 | .735 | .147 | .318 | .448 | .468 | .585 | .119 |
| % VAR | .67 | 1.75 | 1.49 | 6.95 | 1.41 | 3.04 | 4.26 | 4.45 | 5.54 | 1.17 |
| TEMP/RH% | 79/90 | 74/90 | 85/62 | 85/72 | 88/54 | 84/64 | 86/68 | 88/70 | 88/68 | 68/50 |
| FAIL D | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 1/25 |
| **CRC** | 12/28/65 | 01/19/66 | 02/04/66 | 02/24/66 | 03/25/66 | 05/11/66 | | | | |
| AVE % CH | .05 | .12- | .06- | .18 | .53 | .97 | | | | |
| MEAN VAL | 9.921 | 9.904 | 9.910 | 9.935 | 9.969 | 10.013 | | | | |
| STD DEV | .147 | .168 | .156 | .107 | .138 | .085 | | | | |
| % VAR | 1.48 | 1.70 | 1.57 | 1.08 | 1.38 | .85 | | | | |
| TEMP/RH% | 80/23 | 72/21 | 78/46 | 71/59 | 72/50 | 76/50 | | | | |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | |

# TABLE B-2. DATA SUMMARY, FILM RESISTORS

TYPE RN — RESISTOR SUMMARY--% CHANGE — LIMIT 2.00

| TYPE | RN | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JRN | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .02- | .55- | .29- | .25 | .20 | .31 | .20 | .27 | .27 | .25 | .18 | .35 |
| MEAN VAL | 99.68 | 99.66 | 99.13 | 99.38 | 99.93 | 99.88 | 99.98 | 99.87 | 99.94 | 99.94 | 99.93 | 99.85 | 100.02 |
| STD DEV | .85 | .43 | .35 | 1.07 | .74 | .76 | .68 | .93 | 1.02 | 1.06 | .25 | .75 | .55 |
| % VAR | .85 | .43 | .35 | 1.08 | .74 | .76 | .68 | .93 | 1.02 | 1.06 | .25 | .75 | .55 |
| TEMP/RH% | | 80/88 | 84/74 | 84/66 | 80/88 | 77/98 | 79/88 | 88/80 | 84/82 | 80/85 | 84/86 | 73/00 | 86/64 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JERN | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .04 | | .10- | .19 | .11 | .21 | .15 | .17 | .24 | .28 | .31 | .29 |
| MEAN VAL | 99.40 | 99.44 | 99.40 | 99.30 | 99.59 | 99.51 | 99.60 | 99.55 | 99.57 | 99.64 | 99.68 | 99.71 | 99.69 |
| STD DEV | .68 | .72 | .67 | .69 | .37 | .52 | 1.03 | .19 | .46 | .46 | .19 | .54 | .44 |
| % VAR | .68 | .72 | .67 | .69 | .37 | .52 | 1.03 | .19 | .46 | .46 | .19 | .54 | .44 |
| TEMP/RH% | | 82/77 | 84/77 | 80/85 | 81/70 | 79/95 | 82/83 | 89/80 | 85/76 | 80/85 | 81/90 | 74/00 | 90/58 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SRN | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | .05 | .33- | .28- | .09- | .08 | .14 | .06 | .06- | .87- | 2.01- | 3.95- | 7.14- |
| MEAN VAL | 99.63 | 99.69 | 99.31 | 99.36 | 99.55 | 99.72 | 99.78 | 99.69 | 99.58 | 98.77 | 97.63 | 95.70 | 92.53 |
| STD DEV | 1.11 | .45 | .57 | .68 | .42 | .71 | .14 | .98 | .40 | 1.17 | 1.18 | 1.51 | 1.68 |
| % VAR | 1.11 | .45 | .57 | .68 | .42 | .71 | .14 | .98 | .40 | 1.18 | 1.21 | 1.58 | 1.82 |
| TEMP/RH% | | 78/90 | 87/66 | 84/82 | 84/72 | 84/70 | 84/70 | 90/76 | 85/72 | 76/90 | 82/86 | 78/90 | 79/89 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 8/25 | 17/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 2/25 | 8/25 | 25/25 |
| SERN | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | .03- | .28- | .21- | .07- | .01- | .07 | .01 | .01 | .21- | .73- | 1.36- | 1.67- |
| MEAN VAL | 99.78 | 99.75 | 99.50 | 99.57 | 99.71 | 99.77 | 99.85 | 99.79 | 99.78 | 99.58 | 99.05 | 98.43 | 98.12 |
| STD DEV | .50 | .39 | .41 | .81 | .43 | .84 | .43 | .91 | 1.10 | .73 | 1.26 | 1.22 | 1.74 |
| % VAR | .50 | .39 | .41 | .81 | .43 | .84 | .43 | .91 | 1.10 | .73 | 1.27 | 1.24 | 1.77 |
| TEMP/RH% | | 79/86 | 87/72 | 84/73 | 84/72 | 85/67 | 82/80 | 89/79 | 86/75 | 77/90 | 83/90 | 79/90 | 82/77 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 8/25 | 9/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 |
| CRN | | 03/02/64 | 04/09/64 | 07/13/64 | 07/29/64 | 08/18/64 | 09/09/64 | 09/29/64 | 10/26/64 | 11/24/64 | 12/15/64 | 01/05/65 | 01/22/65 |
| AVE % CH | | .05 | .32- | .43- | .02- | .10- | .04- | .13- | .19- | .14- | | .03- | .06- |
| MEAN VAL | 99.33 | 99.38 | 99.01 | 98.90 | 99.31 | 99.23 | 99.30 | 99.20 | 99.14 | 99.19 | 99.34 | 99.30 | 99.27 |
| STD DEV | .85 | .90 | .45 | .93 | .94 | .41 | .89 | .10 | .82 | .38 | .89 | .88 | .80 |
| % VAR | .86 | .91 | .45 | .94 | .95 | .41 | .90 | .10 | .83 | .38 | .90 | .89 | .81 |
| TEMP/RH% | | 74/15 | 80/59 | 77/60 | 74/70 | 76/66 | 78/60 | 83/56 | 75/40 | 81/26 | 72/25 | 78/28 | 74/29 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-2. DATA SUMMARY, FILM RESISTORS (Cont.)

TYPE RN — RESISTOR SUMMARY--% CHANGE — LIMIT 2.00

| JRN | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .40 | .27 | .41 | .42 | .42 | .37 | .58 | .21 | .22 | .13 | .23 | .44 |
| MEAN VAL | 100.08 | 99.95 | 100.08 | 100.09 | 100.09 | 100.05 | 100.26 | 99.88 | 99.89 | 99.81 | 99.91 | 100.11 |
| STD DEV | .85 | .31 | 1.02 | .69 | 1.02 | .41 | 1.61 | 1.00 | 1.06 | .45 | .71 | .64 |
| % VAR | .85 | .31 | 1.02 | .69 | 1.02 | .41 | 1.61 | 1.00 | 1.06 | .45 | .71 | .64 |
| TEMP/RH% | 84/66 | 81/76 | 78/79 | 79/83 | 80/88 | 84/73 | 82/78 | 82/95 | 87/66 | 80/86 | 82/84 | 82/78 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **JERN** | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .36 | .37 | .39 | .47 | .47 | .45 | .47 | .46 | .33 | .54 | .60 | .65 |
| MEAN VAL | 99.75 | 99.76 | 99.79 | 99.87 | 99.86 | 99.85 | 99.87 | 99.86 | 99.73 | 99.93 | 100.00 | 100.05 |
| STD DEV | .97 | .84 | .85 | .50 | .90 | .39 | .73 | .33 | .15 | .70 | .14 | .36 |
| % VAR | .97 | .84 | .85 | .50 | .90 | .39 | .73 | .33 | .15 | .70 | .14 | .36 |
| TEMP/RH% | 84/60 | 81/75 | 82/70 | 80/80 | 81/86 | 85/69 | 82/96 | 78/96 | 87/67 | 77/96 | 80/91 | 82/78 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **SRN** | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | 7.40- | 10.93- | | .23- | .56- | 1.49- | 1.85- | 1.23- | 5.14- | 2.26- | 4.05- | .04 |
| MEAN VAL | 92.26 | 88.74 | 99.63 | 99.41 | 99.08 | 98.15 | 97.80 | 98.41 | 94.52 | 97.39 | 95.68 | 99.68 |
| STD DEV | 2.00 | 3.54 | .96 | .35 | .67 | .91 | 1.64 | .77 | 2.27 | .99 | 2.14 | .79 |
| % VAR | 2.17 | 3.99 | .96 | .35 | .68 | .93 | 1.68 | .78 | 2.40 | 1.02 | 2.24 | .79 |
| TEMP/RH% | 75/84 | 79/00 | 78/80 | 82/85 | 81/75 | 84/70 | 86/68 | 87/76 | 85/72 | 85/66 | 86/61 | 78/96 |
| FAIL D | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 5/25 | 7/25 | 3/25 | 6/25 | 14/25 | 11/25 | 0/25 |
| FAIL C | 24/25 | 25/25 | 0/25 | 0/25 | 0/25 | 0/25 | 3/25 | 0/25 | 18/25 | 3/25 | 11/25 | 0/25 |
| **SERN** | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | 2.00- | 3.84- | .72- | .81- | .67- | .26- | .04- | .21 | .11- | .21 | .16 | .31 |
| MEAN VAL | 97.79 | 95.95 | 99.06 | 98.97 | 99.11 | 99.52 | 99.74 | 99.99 | 99.67 | 99.99 | 99.94 | 100.09 |
| STD DEV | 2.18 | 4.01 | 1.61 | 1.69 | .98 | 1.05 | .34 | .48 | 1.20 | .48 | .74 | .94 |
| % VAR | 2.23 | 4.18 | 1.63 | 1.71 | .99 | 1.06 | .34 | .48 | 1.20 | .48 | .74 | .94 |
| TEMP/RH% | 78/75 | 80/89 | 80/74 | 83/80 | 83/70 | 85/67 | 87/73 | 88/72 | 84/74 | 82/76 | 85/60 | 81/88 |
| FAIL D | 7/25 | 5/25 | 3/25 | 2/25 | 1/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 5/25 | 10/25 | 1/25 | 2/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **CRN** | 02/20/65 | 03/18/65 | 04/10/65 | 06/18/65 | 07/15/65 | 08/16/65 | 09/08/65 | 09/17/65 | 10/07/65 | 10/27/65 | 11/11/65 | 12/07/65 |
| AVE % CH | .01- | .11- | .09- | .03- | .17- | .06- | .10- | .11- | .09- | .11- | .17- | .14- |
| MEAN VAL | 99.32 | 99.23 | 99.25 | 99.30 | 99.17 | 99.27 | 99.23 | 99.22 | 99.24 | 99.22 | 99.17 | 99.19 |
| STD DEV | .90 | .52 | .68 | .57 | .68 | .10 | .85 | .87 | .75 | .83 | .71 | .80 |
| % VAR | .91 | .52 | .69 | .57 | .69 | .10 | .86 | .88 | .76 | .84 | .72 | .81 |
| TEMP/RH% | 72/20 | 79/29 | 78/34 | 72/59 | 73/62 | 70/65 | 73/64 | 72/71 | 76/29 | 75/32 | 82/34 | 78/22 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-2. DATA SUMMARY, FILM RESISTORS (Cont.)

TYPE RN — RESISTOR SUMMARY--% CHANGE — LIMIT 2.00

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| JRN | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | .45 | .42 | .38 | .42 | .40 | .43 | .56 | .46 | .45 | .64 |
| MEAN VAL | 100.12 | 100.09 | 100.05 | 100.09 | 100.08 | 100.10 | 100.23 | 100.13 | 100.13 | 100.31 |
| STD DEV | .75 | .58 | 1.04 | .79 | .44 | .87 | .96 | .59 | .17 | .82 |
| % VAR | .75 | .58 | 1.04 | .79 | .44 | .87 | .96 | .59 | .17 | .82 |
| TEMP/RH% | 76/98 | 76/94 | 85/70 | 82/78 | 88/56 | 86/62 | 82/78 | 89/56 | 84/66 | 72/47 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JERN | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | .65 | .60 | .59 | .68 | .69 | .74 | .79 | .76 | .76 | 1.03 |
| MEAN VAL | 100.05 | 99.99 | 99.98 | 100.07 | 100.08 | 100.13 | 100.18 | 100.15 | 100.15 | 100.42 |
| STD DEV | .66 | .89 | 1.11 | 1.04 | .92 | .66 | .36 | .18 | 1.00 | .60 |
| % VAR | .66 | .89 | 1.11 | 1.04 | .92 | .66 | .36 | .18 | 1.00 | .60 |
| TEMP/RH% | 76/98 | 78/84 | 84/70 | 85/73 | 88/56 | 86/62 | 83/70 | 89/56 | 84/66 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SRN | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | .01 | .10 | .06 | .19- | .16 | .10 | .30 | .46 | .46 | .81 |
| MEAN VAL | 99.65 | 99.74 | 99.69 | 99.45 | 99.79 | 99.74 | 99.93 | 100.09 | 100.09 | 100.45 |
| STD DEV | .29 | .47 | 1.10 | .70 | .89 | .40 | .69 | 1.02 | 1.33 | .53 |
| % VAR | .29 | .47 | 1.10 | .70 | .89 | .40 | .69 | 1.02 | 1.33 | .53 |
| TEMP/RH% | 79/96 | 74/92 | 6 /66 | 85/72 | | 85/62 | 86/66 | 88/70 | 89/68 | 66/50 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 4/25 | 2/25 | 3/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SERN | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | .34 | .76 | .45 | .45 | .47 | .60 | 1.06 | .61 | .79 | .92 |
| MEAN VAL | 100.12 | 100.54 | 100.24 | 100.24 | 100.27 | 100.39 | 100.85 | 100.43 | 100.61 | 100.74 |
| STD DEV | .68 | 1.71 | .71 | 1.04 | .51 | 1.14 | 2.06 | .57 | .80 | .51 |
| % VAR | .68 | 1.70 | .71 | 1.04 | .51 | 1.14 | 2.04 | .57 | .80 | .51 |
| TEMP/RH% | 79/90 | 74/92 | 85/62 | 85/72 | 88/54 | 84/64 | 86/66 | 88/72 | 88/66 | 68/50 |
| FAIL D | 0/25 | 0/25 | 0/24 | 0/24 | 0/25 | 1/25 | 0/25 | 0/25 | 2/25 | 0/25 |
| FAIL C | 0/25 | 1/25 | 0/24 | 0/24 | 1/25 | 1/25 | 2/25 | 2/25 | 2/25 | 2/25 |
| CRN | 12/28/65 | 01/19/66 | 02/04/66 | 02/24/66 | 03/25/66 | 05/11/66 | | | | |
| AVE % CH | .18- | .06 | .15 | .09 | .23 | .12- | | | | |
| MEAN VAL | 99.16 | 99.40 | 99.49 | 99.42 | 99.57 | 99.22 | | | | |
| STD DEV | .88 | .99 | .62 | .90 | .58 | .86 | | | | |
| % VAR | .89 | 1.00 | .62 | .91 | .58 | .87 | | | | |
| TEMP/RH% | 80/23 | 73/21 | 78/46 | 72/58 | 71/52 | 76/50 | | | | |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | |

## TABLE B-3. DATA SUMMARY, WIREWOUND RESISTORS (RW)

| TYPE RW | | RESISTOR SUMMARY--% CHANGE | | | | | | | | | LIMIT | | 5.25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JRW | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .02- | .02- | .18- | .05- | .02 | .01 | .02 | .01 | .02- | .03- | .13- | .06 |
| MEAN VAL | 913.7 | 913.4 | 913.4 | 912.0 | 913.2 | 913.8 | 913.8 | 913.9 | 913.8 | 913.5 | 913.4 | 912.5 | 914.2 |
| STD DEV | 4.8 | 10.1 | 10.1 | 11.5 | 2.8 | 8.5 | 7.1 | 7.7 | 6.7 | 8.3 | 9.9 | 3.3 | 2.7 |
| % VAR | .53 | 1.11 | 1.11 | 1.26 | .31 | .93 | .78 | .84 | .73 | .91 | 1.08 | .36 | .30 |
| TEMP/RH% | | 80/84 | 84/72 | 85/80 | 80/84 | 78/98 | 80/86 | 87/82 | 84/86 | 80/84 | 84/84 | 74/00 | 86/62 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JERW | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .02- | .06- | .28- | .04- | .03 | .03 | .04 | .02 | | .02- | .07- | .06 |
| MEAN VAL | 903.9 | 903.7 | 903.3 | 901.3 | 903.5 | 904.2 | 904.2 | 904.2 | 904.1 | 903.8 | 903.7 | 903.2 | 904.4 |
| STD DEV | 8.7 | 11.3 | 10.2 | 12.1 | 9.6 | 9.5 | 8.3 | 14.4 | 8.7 | 14.0 | 11.3 | 14.1 | 11.2 |
| % VAR | .96 | 1.25 | 1.13 | 1.34 | 1.06 | 1.05 | .92 | 1.59 | .96 | 1.55 | 1.25 | 1.56 | 1.24 |
| TEMP/RH% | | 82/79 | 83/80 | 80/89 | 80/72 | 80/88 | 82/79 | 89/76 | 85/76 | 80/80 | 81/90 | 74/00 | 90/59 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SRW | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | | .09- | .36- | .08- | .03 | .03 | .02 | .02 | .02- | .05- | .06- | .03 |
| MEAN VAL | 902.2 | 902.2 | 901.4 | 899.0 | 901.5 | 902.5 | 902.5 | 902.4 | 902.4 | 902.0 | 901.8 | 901.7 | 902.6 |
| STD DEV | 13.0 | 13.3 | 11.8 | 9.1 | 14.5 | 9.5 | 9.1 | 14.1 | 14.3 | 14.4 | 11.5 | 11.2 | 6.3 |
| % VAR | 1.44 | 1.47 | 1.31 | 1.01 | 1.61 | 1.05 | 1.01 | 1.56 | 1.58 | 1.60 | 1.28 | 1.24 | .70 |
| TEMP/RH% | | 78/93 | 87/68 | 84/70 | 85/72 | 84/72 | 84/74 | 90/72 | 85/72 | 76/86 | 82/90 | 78/88 | 81/76 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SERW | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | .07- | .26- | .74- | .37 | .01 | .01 | .02 | .01 | .02- | .04- | .07- | .01- |
| MEAN VAL | 902.6 | 902.0 | 900.3 | 895.9 | 905.9 | 902.8 | 902.8 | 902.9 | 902.7 | 902.5 | 902.2 | 902.0 | 902.5 |
| STD DEV | 18.4 | 13.8 | 16.3 | 17.4 | 25.6 | 14.4 | 12.8 | 13.3 | 16.9 | 13.9 | 17.9 | 14.9 | 16.0 |
| % VAR | 2.04 | 1.53 | 1.81 | 1.94 | 2.83 | 1.60 | 1.42 | 1.47 | 1.87 | 1.54 | 1.98 | 1.65 | 1.77 |
| TEMP/RH% | | 79/84 | 87/71 | 83/83 | 84/75 | 85/66 | 82/82 | 90/74 | 87/71 | 78/86 | 83/90 | 79/86 | 84/70 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CRW | | 02/25/64 | 06/10/64 | 07/13/64 | 07/29/64 | 08/18/64 | 09/09/64 | 09/29/64 | 10/27/64 | 11/24/64 | 12/15/64 | 01/05/65 | 01/22/65 |
| AVE % CH | | | .26- | .08- | .09- | .13- | .12- | .06- | .11- | .08- | .08- | .09- | .10- |
| MEAN VAL | 905.3 | 905.3 | 903.0 | 904.5 | 904.5 | 904.1 | 904.2 | 904.7 | 904.3 | 904.5 | 904.6 | 904.5 | 904.4 |
| STD DEV | 10.5 | 12.0 | 15.7 | 14.1 | 13.1 | 9.5 | 11.3 | 15.2 | 10.7 | 14.9 | 12.4 | 7.9 | 11.1 |
| % VAR | 1.16 | 1.33 | 1.74 | 1.56 | 1.45 | 1.05 | 1.25 | 1.68 | 1.18 | 1.65 | 1.37 | .87 | 1.23 |
| TEMP/RH% | | 74/15 | 81/60 | 77/60 | 74/69 | 76/65 | 78/60 | 83/56 | 75/41 | 81/26 | 73/26 | 78/28 | 75/30 |
| FAIL D | | 0/50 | 1/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

TABLE B-3. DATA SUMMARY, WIREWOUND RESISTORS (RW) (Cont.)

| TYPE RW | RESISTOR SUMMARY--% CHANGE | | | | | | | | | | LIMIT | 5.25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JRW | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .05 | .06 | .03 | .03 | .04 | .04 | .01 | .01 | | | .01 | |
| MEAN VAL | 914.1 | 914.2 | 914.0 | 914.0 | 914.0 | 914.1 | 913.7 | 913.7 | 913.7 | 913.7 | 913.7 | 913.6 |
| STD DEV | 11.1 | 5.2 | 6.0 | 6.5 | 11.5 | 6.1 | 8.9 | 11.8 | 4.7 | 4.7 | 8.5 | 11.4 |
| % VAR | 1.21 | .57 | .66 | .71 | 1.26 | .67 | .97 | 1.29 | .51 | .51 | .93 | 1.25 |
| TEMP/RH% | 84/64 | 81/79 | 79/78 | 79/83 | 80/87 | 85/70 | 83/70 | 83/92 | 87/66 | 80/86 | 81/90 | 82/80 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JERW | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .05 | .05 | .06 | .06 | .07 | .07 | .04 | .04 | .01 | .01 | .01 | |
| MEAN VAL | 904.3 | 904.3 | 904.4 | 904.4 | 904.5 | 904.5 | 904.2 | 904.2 | 904.0 | 904.0 | 904.0 | 903.8 |
| STD DEV | 15.1 | 14.6 | 12.8 | 13.6 | 10.3 | 10.6 | 14.8 | 12.5 | 8.3 | 11.9 | 9.6 | 14.0 |
| % VAR | 1.67 | 1.61 | 1.42 | 1.50 | 1.14 | 1.17 | 1.64 | 1.38 | .92 | 1.32 | 1.06 | 1.55 |
| TEMP/RH% | 84/60 | 81/74 | 82/71 | 81/76 | 81/86 | 86/67 | 82/93 | 78/96 | 87/66 | 76/96 | 80/92 | 82/80 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SRW | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .02 | .04 | .04 | .05 | .05 | .06 | .23 | .04 | .05 | .04 | .05 | .04 |
| MEAN VAL | 902.4 | 902.6 | 902.6 | 902.7 | 902.7 | 902.8 | 904.3 | 902.6 | 902.6 | 902.6 | 902.7 | 902.6 |
| STD DEV | 12.8 | 6.9 | 12.5 | 7.3 | 12.1 | 11.2 | 13.8 | 9.2 | 14.4 | 13.1 | 9.8 | 12.4 |
| % VAR | 1.42 | .76 | 1.38 | .81 | 1.34 | 1.24 | 1.53 | 1.02 | 1.60 | 1.45 | 1.09 | 1.37 |
| TEMP/RH% | 77/74 | 79/94 | 79/78 | 82/82 | 82/74 | 84/70 | 86/68 | 89/72 | 84/80 | 85/70 | 85/62 | 78/96 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SERW | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .01- | .02- | .03 | .03 | .04 | .04 | .09 | .07 | .07 | .08 | .09 | .07 |
| MEAN VAL | 902.5 | 902.4 | 903.0 | 903.0 | 903.0 | 903.0 | 903.4 | 903.3 | 903.3 | 903.4 | 903.5 | 903.3 |
| STD DEV | 16.7 | 16.2 | 13.9 | 13.9 | 16.5 | 17.7 | 17.8 | 16.2 | 13.7 | 13.2 | 14.0 | 16.2 |
| % VAR | 1.85 | 1.80 | 1.54 | 1.54 | 1.83 | 1.96 | 1.97 | 1.79 | 1.52 | 1.46 | 1.55 | 1.79 |
| TEMP/RH% | 78/76 | 80/84 | 81/70 | 84/78 | 83/68 | 85/66 | 87/68 | 88/72 | 86/72 | 84/66 | 85/60 | 81/86 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CRW | 02/20/65 | 03/08/65 | 04/10/65 | 06/18/65 | 07/15/65 | 08/16/65 | 09/08/65 | 09/17/65 | 10/07/65 | 10/27/65 | 11/16/65 | 12/08/65 |
| AVE % CH | .09- | .09- | .10- | .11- | .17- | .15- | .20- | .17- | .13- | .12- | .11- | .14- |
| MEAN VAL | 904.4 | 904.5 | 904.3 | 904.3 | 903.7 | 903.9 | 903.5 | 903.8 | 904.1 | 904.2 | 904.3 | 904.0 |
| STD DEV | 14.1 | 12.2 | 14.6 | 8.3 | 14.7 | 13.4 | 10.8 | 11.1 | 12.2 | 9.3 | 12.5 | 14.3 |
| % VAR | 1.56 | 1.35 | 1.61 | .92 | 1.63 | 1.48 | 1.20 | 1.23 | 1.35 | 1.03 | 1.38 | 1.58 |
| TEMP/RH% | 72/20 | 79/29 | 78/34 | 69/56 | 73/62 | 70/65 | 73/63 | 72/71 | 75/34 | 75/32 | 82/34 | 78/21 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

# TABLE B-3. DATA SUMMARY, WIREWOUND RESISTORS (RW) (Cont.)

TYPE RW — RESISTOR SUMMARY--% CHANGE — LIMIT 5.25

| JRW | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .01- | .04- | .01- | .03- | .03- | .02 | .03- | .03- | .04- | .05- |
| MEAN VAL | 913.5 | 913.3 | 913.5 | 913.4 | 913.4 | 913.8 | 913.4 | 913.3 | 913.3 | 913.2 |
| STD DEV | 11.1 | 10.4 | 9.7 | 9.1 | 8.6 | 9.7 | 6.0 | 11.4 | 2.8 | .6 |
| % VAR | 1.22 | 1.14 | 1.06 | 1.00 | .94 | 1.06 | .66 | 1.25 | .31 | .07 |
| TEMP/RH% | 76/98 | 76/90 | 84/70 | 81/80 | 88/56 | 86/62 | 82/74 | 89/56 | 84/66 | 72/47 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **JERW** | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/[illegible] | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | .04- | .03- | .02- | .02- | .02- | .04 | .01- | .01- | .02- | .04- |
| MEAN VAL | 903.5 | 903.5 | 903.7 | 903.7 | 903.7 | 904.2 | 903.8 | 903.7 | 903.6 | 903.5 |
| STD DEV | 13.0 | 14.4 | 7.4 | 7.9 | 12.8 | 14.3 | 13.0 | 15.1 | 13.[illegible] | 10.9 |
| % VAR | 1.44 | 1.59 | .82 | .87 | 1.42 | 1.58 | 1.44 | 1.67 | 1.5[illegible] | 1.21 |
| TEMP/RH% | 76/98 | 80/82 | 84/70 | 85/73 | 88/56 | 87/60 | 83/65 | 89/56 | 84/6[illegible] | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **SRW** | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | .13- | .11- | .02- | .02- | .02- | .01- | | .16 | .13 | |
| MEAN VAL | 901.1 | 901.2 | 902.0 | 902.1 | 902.1 | 902.1 | 902.2 | 903.6 | 903.4 | 902.2 |
| STD DEV | 11.6 | 12.2 | 12.8 | 9.2 | 8.4 | 12.5 | 14.1 | 16.5 | 12.0 | 11.5 |
| % VAR | 1.29 | 1.35 | 1.42 | 1.02 | .93 | 1.39 | 1.56 | 1.83 | 1.33 | 1.27 |
| TEMP/RH% | 79/96 | 74/92 | 86/66 | 85/72 | 88/58 | 84/64 | 86/65 | 88/70 | 89/68 | 66/50 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **SERW** | 10/[illegible]3/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | .01 | .04 | .11 | .18 | .16 | .16 | .22 | .18 | .19 | .62 |
| MEAN VAL | 902.7 | 903.0 | 903.6 | 904.3 | 904.1 | 904.1 | 904.6 | 904.2 | 904.3 | 908.1 |
| STD DEV | 18.2 | 17.7 | 17.8 | 14.6 | 13.2 | 16.5 | 16.9 | 17.9 | 15.3 | 20.0 |
| % VAR | 2.02 | 1.96 | 1.97 | 1.61 | 1.46 | 1.83 | 1.87 | 1.98 | 1.69 | 2.20 |
| TEMP/RH% | 79/92 | 74/92 | 84/63 | 85/72 | 87/60 | 84/64 | 87/62 | 88/72 | 88/68 | 68/50 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| **CRW** | 12/28/65 | 01/19/66 | 02/04/66 | 02/24/66 | 03/25/66 | 05/11/66 | | | | |
| AVE % CH | .12- | .07- | .09- | .10- | 1.18- | .10- | | | | |
| MEAN VAL | 904.2 | 904.7 | 904.4 | 904.4 | 894.5 | 904.4 | | | | |
| STD DEV | 11.8 | 10.2 | 15.0 | 12.8 | 70.4 | 9.8 | | | | |
| % VAR | 1.31 | 1.13 | 1.66 | 1.42 | 7.87 | 1.08 | | | | |
| TEMP/RH% | 80/22 | 73/21 | 78/46 | 71/59 | 69/52 | 76/50 | | | | |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 1/50 | 0/50 | | | | |

# TABLE B-4. DATA SUMMARY, SOLID TANTALUM ELECTROLYTIC CAPACITORS (CS)

TYPE CS — CAPACITOR SUMMARY--% CHANGE — LIMIT 12.00

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCS | | 06/20/64 | 06/23/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/20/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .46- | .22- | .38- | .06- | .22 | 1.03 | .83 | .91 | .38- | .21 | .62- | .56 |
| MEAN VAL | .988 | .983 | .985 | .984 | .987 | .990 | .998 | .996 | .997 | .984 | .990 | .982 | .993 |
| STD DEV | .012 | .033 | .041 | .020 | .028 | .022 | .022 | .025 | .011 | .028 | .020 | .011 | .035 |
| % VAR | 1.21 | 3.36 | 4.16 | 2.03 | 2.84 | 2.22 | 2.20 | 2.51 | 1.10 | 2.85 | 2.02 | 1.12 | 3.52 |
| TEMP/RH% | | 76/98 | 80/84 | 84/88 | 80/88 | 81/70 | 87/64 | 84/79 | 90/69 | 74/94 | 85/84 | 82/86 | 87/65 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JECS | | 06/20/64 | 06/22/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .38- | .14- | 1.20- | .01 | .13 | 1.18 | .72 | .82 | .69- | .32 | .59- | .58 |
| MEAN VAL | 1.013 | 1.009 | 1.012 | 1.001 | 1.013 | 1.015 | 1.025 | 1.021 | 1.022 | 1.006 | 1.016 | 1.007 | 1.019 |
| STD DEV | .034 | .041 | .017 | .018 | .039 | .005 | .034 | .012 | .008 | .037 | .040 | .037 | .032 |
| % VAR | 3.36 | 4.06 | 1.68 | 1.80 | 3.85 | .49 | 3.32 | 1.18 | .78 | 3.68 | 3.94 | 3.67 | 3.14 |
| TEMP/RH% | | 79/73 | 85/72 | 86/74 | 82/75 | 82/71 | 89/62 | 85/80 | 91/62 | 72/00 | 87/76 | 79/88 | 89/60 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SCS | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | | .13- | .05- | .59 | 1.40 | 1.35 | 1.74 | .95 | .20 | .38 | .63- | .85 |
| MEAN VAL | .993 | .993 | .992 | .992 | .999 | 1.007 | 1.006 | 1.010 | 1.002 | .995 | .997 | .987 | 1.001 |
| STD DEV | .019 | .017 | .018 | .029 | .007 | .013 | .036 | .031 | .034 | .021 | .007 | .017 | .037 |
| % VAR | 1.91 | 1.71 | 1.81 | 2.92 | .70 | 1.29 | 3.58 | 3.07 | 3.39 | 2.11 | .70 | 1.72 | 3.70 |
| TEMP/RH% | | 79/96 | 80/98 | 82/82 | 84/72 | 90/62 | 85/64 | 93/74 | 90/72 | 78/84 | 86/80 | 82/82 | 84/63 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SECS | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | .02- | .90- | 2.45- | .40- | 1.03 | .17 | 1.23 | .59 | .66- | .06- | .68- | .18 |
| MEAN VAL | 1.016 | 1.016 | 1.007 | .992 | 1.012 | 1.027 | 1.018 | 1.029 | 1.023 | 1.010 | 1.016 | 1.010 | 1.018 |
| STD DEV | .041 | .035 | .028 | .016 | .035 | .027 | .034 | .025 | .017 | .017 | .020 | .004 | .037 |
| % VAR | 4.04 | 3.44 | 2.78 | 1.61 | 3.46 | 2.63 | 3.34 | 2.43 | 1.66 | 1.68 | 1.97 | .40 | 3.63 |
| TEMP/RH% | | 84/74 | 84/79 | 73/00 | 81/85 | 89/60 | 82/79 | 94/70 | 88/70 | 72/00 | 84/84 | 81/83 | 82/66 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CCS | | 03/06/64 | 06/11/64 | 07/13/64 | 07/28/64 | 08/21/64 | 09/11/64 | 10/03/64 | 10/29/64 | 11/27/64 | 12/17/64 | 01/07/65 | 01/26/65 |
| AVE % CH | | .29- | .38- | .33- | .66- | .64- | .70- | .63- | .71- | .41- | .96- | .85- | .93- |
| MEAN VAL | 1.022 | 1.019 | 1.018 | 1.018 | 1.015 | 1.015 | 1.015 | 1.016 | 1.015 | 1.018 | 1.012 | 1.013 | 1.012 |
| STD DEV | .026 | .031 | .029 | .043 | .037 | .041 | .018 | .008 | .009 | .015 | .033 | .036 | .039 |
| % VAR | 2.54 | 3.04 | 2.85 | 4.22 | 3.65 | 4.04 | 1.77 | .79 | .89 | 1.47 | 3.26 | 3.55 | 3.85 |
| TEMP/RH% | | 79/15 | 81/53 | 77/60 | 82/66 | 82/63 | 78/65 | 82/57 | 78/47 | 79/42 | 73/41 | 74/34 | 74/38 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 1/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

# TABLE B-4. DATA SUMMARY, SOLID TANTALUM ELECTROLYTIC CAPACITORS (CS) (Cont.)

| TYPE CS | CAPACITOR SUMMARY--% CHANGE | | | | | | | | | LIMIT | 12.00 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCS | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/02/65 | 07/22/65 | 08/12/65 | 08/31/65I | 10/04/65 |
| AVE % CH | .58 | .53 | .45 | .38 | .77 | .89 | .15 | | .33 | .22- | .23 | .23 |
| MEAN VAL | .993 | .993 | .992 | .991 | .995 | .996 | .989 | .988 | .991 | .985 | .990 | .990 |
| STD DEV | .041 | .026 | .032 | .041 | .038 | .042 | .033 | .013 | .026 | .042 | .027 | .026 |
| % VAR | 4.13 | 2.62 | 3.23 | 4.14 | 3.82 | 4.22 | 3.34 | 1.32 | 2.62 | 4.26 | 2.73 | 2.63 |
| TEMP/RH% | 85/66 | 87/59 | 86/60 | 85/68 | 87/69 | 89/58 | 81/95 | 80/96 | 82/80 | 76/96 | 83/76 | 84/78 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JECS | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .42 | .18 | .28 | .39 | .50 | .55 | .23 | .12 | .52 | .51- | .44- | .07- |
| MEAN VAL | 1.018 | 1.015 | 1.016 | 1.017 | 1.018 | 1.019 | 1.016 | 1.015 | 1.019 | 1.008 | 1.009 | 1.011 |
| STD DEV | .015 | .031 | .028 | .033 | .036 | .018 | .006 | .018 | .016 | .030 | .018 | .034 |
| % VAR | 1.47 | 3.05 | 2.76 | 3.24 | 3.54 | 1.77 | .59 | 1.77 | 1.57 | 2.98 | 1.78 | 3.36 |
| TEMP/RH% | 85/65 | 85/63 | 86/62 | 87/63 | 86/71 | 89/57 | 78/96 | 85/92 | 86/68 | 77/96 | 80/94 | 85/72 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/24 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/24 |
| SCS | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/30/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .18 | .47 | .71 | .73 | 1.07 | 1.08 | .51 | .42 | .41- | .39 | 1.02 | .56 |
| MEAN VAL | .995 | .997 | 1.000 | 1.000 | 1.003 | 1.004 | .998 | .997 | .989 | .997 | 1.003 | .998 |
| STD DEV | .006 | .002 | .019 | .028 | .040 | .013 | .021 | .025 | .015 | .007 | .026 | .036 |
| % VAR | .60 | .20 | 1.90 | 2.80 | 3.99 | 1.29 | 2.10 | 2.51 | 1.52 | .70 | 2.59 | 3.61 |
| TEMP/RH% | 80/82 | 85/69 | 85/62 | 87/74 | 89/57 | 88/62 | 83/84 | 83/86 | 71/96 | 82/76 | 86/62 | 83/82 |
| FAIL D | 0/25 | 6/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 |
| FAIL C | 0/25 | 6/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SECS | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .61- | .38 | .31 | .60 | .43 | .31 | .22 | .07 | .14 | .14- | .07 | .22 |
| MEAN VAL | 1.010 | 1.020 | 1.020 | 1.023 | 1.021 | 1.020 | 1.019 | 1.017 | 1.018 | 1.015 | 1.017 | 1.019 |
| STD DEV | .036 | .039 | .007 | .005 | .022 | .008 | .007 | .034 | .021 | .029 | .035 | .010 |
| % VAR | 3.56 | 3.82 | .69 | .49 | 2.15 | .78 | .69 | 3.34 | 2.06 | 2.86 | 3.44 | .98 |
| TEMP/RH% | 76/00 | 86/64 | 85/58 | 87/70 | 88/60 | 83/68 | 84/69 | 82/86 | 84/74 | 80/90 | 84/70 | 86/78 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CCS | 02/20/65 | 03/19/65 | 04/10/65 | 06/22/65 | 07/19/65 | 08/16/65 | 09/17/65 | 10/07/65 | 10/28/65 | 11/11/65 | 12/27/65 | 01/18/66 |
| AVE % CH | .86- | .40- | .63- | 1.08- | 1.16- | 1.37- | .23- | 1.06- | .76- | .29- | .71- | 1.25- |
| MEAN VAL | 1.013 | 1.018 | 1.015 | 1.011 | 1.010 | 1.008 | 1.020 | 1.011 | 1.014 | 1.019 | 1.015 | 1.009 |
| STD DEV | .032 | .020 | .043 | .024 | .030 | .026 | .093 | .032 | .032 | .028 | .004 | .032 |
| % VAR | 3.16 | 1.96 | 4.24 | 2.37 | 2.97 | 2.58 | 9.12 | 3.17 | 3.16 | 2.75 | .39 | 3.17 |
| TEMP/RH% | 74/20 | 78/26 | 78/34 | 73/70 | 73/62 | 71/62 | 72/70 | 74/57 | 76/32 | 82/34 | 78/21 | 72/21 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 1/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

TABLE B-4. DATA SUMMARY, SOLID TANTALUM ELECTROLYTIC CAPACITORS (CS) (Cont.)

CAPACITOR SUMMARY--% CHANGE

LIMIT 12.00
DF LIM

| TYPE CS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| JCS | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | .10- | .02- | .08 | .02 | .05 | .59 | .20 | .57 | .70 | .50- |
| MEAN VAL | .987 | .987 | .988 | .988 | .988 | .993 | .990 | .993 | .995 | .983 |
| STD DEV | .005 | .040 | .039 | .023 | .035 | .042 | .016 | .039 | .004 | .015 |
| % VAR | .51 | 4.05 | 3.95 | 2.33 | 3.54 | 4.23 | 1.62 | 3.93 | .40 | 1.53 |
| TEMP/RH% | 81/66 | 78/90 | 80/85 | 79/86 | 83/71 | 85/70 | 79/88 | 86/63 | 82/68 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JECS | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | .37- | .21- | .12 | .10- | .05- | .07- | .03- | .53 | .65 | .95- |
| MEAN VAL | 1.008 | 1.010 | 1.013 | 1.011 | 1.012 | 1.011 | 1.012 | 1.017 | 1.019 | 1.002 |
| STD DEV | .033 | .014 | .032 | .025 | .020 | .035 | .012 | .037 | .014 | .036 |
| % VAR | 3.27 | 1.39 | 3.16 | 2.47 | 1.98 | 3.46 | 1.19 | 3.64 | 1.37 | 3.59 |
| TEMP/RH% | 82/64 | 80/90 | 84/73 | 82/80 | 86/62 | 82/76 | 80/84 | 87/62 | 82/68 | 72/46 |
| FAIL D | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 |
| FAIL C | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 | 0/24 |
| SCS | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | .14- | .15- | .02- | .22 | .27 | .25 | .51 | 1.07 | 1.08 | .63- |
| MEAN VAL | .991 | .991 | .993 | .995 | .995 | .995 | .998 | 1.003 | 1.004 | .987 |
| STD DEV | .036 | .035 | .013 | .020 | .037 | .033 | .019 | .041 | .017 | .015 |
| % VAR | 3.63 | 3.53 | 1.31 | 2.01 | 3.72 | 3.32 | 1.90 | 4.09 | 1.69 | 1.52 |
| TEMP/RH% | 82/84 | 74/92 | 82/70 | 81/80 | 85/63 | 82/67 | 82/79 | 86/76 | 86/72 | 66/52 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 2/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | C.25 | 0/25 | 1/25 | 0/25 |
| SECS | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | .01 | .15- | .07- | .14- | .15- | .15- | .10 | .68 | .25 | 1.41- |
| MEAN VAL | 1.017 | 1.015 | 1.016 | 1.015 | 1.015 | 1.015 | 1.017 | 1.023 | 1.018 | 1.001 |
| STD DEV | .018 | .019 | .037 | .028 | .019 | .019 | .040 | .039 | .022 | .030 |
| % VAR | 1.77 | 1.87 | 3.64 | 2.76 | 1.87 | 1.87 | 3.93 | 3.81 | 2.16 | 3.00 |
| TEMP/RH% | 82/80 | 76/84 | 84/70 | 84/76 | 82/73 | 79/73 | 84/72 | 88/68 | 82/90 | 66/50 |
| FAIL D | 0/25 | 0/25 | 0/24 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/23 | 0/23 |
| FAIL C | 0/25 | 0/25 | 0/24 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/23 | 0/23 |
| CCS | 02/C4/66 | 02/24/66 | 03/28/66 | 05/18/66 | | | | | | |
| AVE % CH | 1.69- | 1.77- | 1.48- | .78- | | | | | | |
| MEAN VAL | 1.005 | 1.004 | 1.007 | 1.014 | | | | | | |
| STD DEV | .007 | .021 | .018 | .027 | | | | | | |
| % VAR | .70 | 2.09 | 1.79 | 2.66 | | | | | | |
| TEMP/RH% | 79/47 | 70/59 | 72/44 | 77/64 | | | | | | |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | | | | | | |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | | | | | | |

# TABLE B-5. DATA SUMMARY, CERAMIC CAPACITORS (CK)

TYPE CK — CAPACITOR SUMMARY--% CHANGE — LIMIT 15.00

| JCK | | 06/20/64 | 06/23/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .44 | .05- | .63 | 8.61 | 5.06 | 6.21 | 1.62- | 3.08 | .82 | .21- | .24- | .48- |
| MEAN VAL | 102.3 | 102.8 | 102.2 | 102.9 | 111.0 | 107.4 | 108.6 | 101.5 | 105.4 | 103.1 | 102.0 | 102.0 | 101.8 |
| STD DEV | 3.9 | 5.6 | 5.7 | 5.2 | 18.0 | 14.8 | 14.0 | 41.7 | 10.8 | 6.6 | 6.0 | 7.2 | 4.6 |
| % VAR | 3.81 | 5.45 | 5.58 | 5.05 | 16.22 | 13.78 | 12.89 | 41.08 | 10.25 | 6.40 | 5.88 | 7.06 | 4.52 |
| TEMP/RH% | | 74/99 | 77/00 | 81/89 | 79/91 | 82/68 | 84/72 | 86/84 | 92/68 | 72/00 | 86/80 | 82/82 | 88/66 |
| FAIL D | | 2/25 | 0/25 | 0/25 | 5/25 | 2/25 | 2/25 | 2/25 | 4/25 | 1/25 | 1/25 | 1/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 2/25 | 2/25 | 4/25 | 5/25 | 1/25 | 1/25 | 1/25 | 1/25 | 0/25 |
| **JECK** | | 06/20/64 | 06/23/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | 1.11 | .71 | .91 | 8.47 | 10.73 | 14.21 | 12.64 | 11.92 | 6.44 | 5.74 | 7.73 | 4.53 |
| MEAN VAL | 98.6 | 99.6 | 99.3 | 99.4 | 106.8 | 108.9 | 112.3 | 110.8 | 110.0 | 104.7 | 104.1 | 106.0 | 103.0 |
| STD DEV | 3.6 | 5.8 | 4.3 | 5.8 | 10.6 | 12.2 | 21.1 | 16.5 | 21.2 | 9.9 | 8.3 | 10.1 | 6.9 |
| % VAR | 3.65 | 5.82 | 4.33 | 5.84 | 9.93 | 11.20 | 18.79 | 14.89 | 19.27 | 9.46 | 7.97 | 9.53 | 6.70 |
| TEMP/RH% | | 78/85 | 84/72 | 85/72 | 81/87 | 82/70 | 90/62 | 85/80 | 88/74 | 82/80 | 85/80 | 79/90 | 89/60 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 4/25 | 3/25 | 0/25 | 0/25 | 3/25 | 3/25 | 3/25 | 4/25 | 4/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 1/25 | 2/25 | 6/25 | 6/25 | 4/25 | 3/25 | 3/25 | 4/25 | 0/25 |
| **SCK** | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | .77 | .86 | .42 | 1.95 | 3.36 | 4.53 | 3.88 | 1.99 | 14.47 | 15.50 | 30.36 | 41.18 |
| MEAN VAL | 100.9 | 101.6 | 101.7 | 101.3 | 102.8 | 104.2 | 105.4 | 104.8 | 102.8 | 115.5 | 116.5 | 131.5 | 142.5 |
| STD DEV | 3.8 | 4.3 | 3.8 | 3.5 | 7.3 | 7.5 | 7.0 | 5.3 | 8.4 | 11.4 | 8.8 | 11.4 | 17.8 |
| % VAR | 3.77 | 4.23 | 3.74 | 3.46 | 7.10 | 7.20 | 6.64 | 5.06 | 8.17 | 9.87 | 7.55 | 8.67 | 12.49 |
| TEMP/RH% | | 76/98 | 78/00 | 77/00 | 83/72 | 90/62 | 85/70 | 89/81 | 90/72 | 80/84 | 86/80 | 83/78 | 82/64 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 6/25 | 9/25 | 4/25 | 1/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 2/25 | 2/25 | 21/25 | 24/25 | 25/25 | 25/25 |
| **SECK** | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | 1.79 | 1.28 | 2.55 | 4.61 | 6.01 | 6.94 | 8.56 | 6.18 | 6.20 | 7.84 | 15.61 | 1.59 |
| MEAN VAL | 99.7 | 101.5 | 101.0 | 102.2 | 104.2 | 105.6 | 106.6 | 108.2 | 105.8 | 105.8 | 107.5 | 115.3 | 101.3 |
| STD DEV | 6.0 | 5.1 | 4.3 | 5.8 | 7.7 | 8.3 | 7.4 | 8.8 | 7.5 | 7.0 | 8.5 | 12.4 | 19.4 |
| % VAR | 6.02 | 5.02 | 4.26 | 5.68 | 7.39 | 7.86 | 6.94 | 8.13 | 7.09 | 6.62 | 7.91 | 10.75 | 19.15 |
| TEMP/RH% | | 83/72 | 82/76 | 84/80 | 79/89 | 89/63 | 82/82 | 92/74 | 88/68 | 73/00 | 83/85 | 84/80 | 82/67 |
| FAIL D | | 0/25 | 0/25 | 2/25 | 2/25 | 0/25 | 1/25 | 1/25 | 4/25 | 10/25 | 11/25 | 4/25 | 3/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 2/25 | 1/25 | 2/25 | 1/25 | 7/25 | 10/25 | 19/25 | 2/25 |
| **CCK** | | 03/04/64 | 06/11/64 | 07/09/64 | 07/29/64 | 08/21/64 | 09/11/64 | 10/03/64 | 10/29/64 | 11/27/64 | 12/16/64 | 01/07/65 | 01/25/65 |
| AVE % CH | | 1.54- | 3.01- | .67- | .98 | 1.01 | 2.90 | 2.95 | 2.54 | 1.55 | 1.63 | 1.90 | .66 |
| MEAN VAL | 99.9 | 98.4 | 96.9 | 99.3 | 100.9 | 100.9 | 102.8 | 102.9 | 102.5 | 101.5 | 101.5 | 101.8 | 100.6 |
| STD DEV | 3.6 | 2.6 | 3.8 | 4.4 | 3.2 | 3.7 | 4.1 | 2.5 | 3.7 | 2.8 | 3.9 | 2.7 | 3.6 |
| % VAR | 3.60 | 2.64 | 3.92 | 4.43 | 3.17 | 3.67 | 3.99 | 2.43 | 3.61 | 2.76 | 3.84 | 2.65 | 3.58 |
| TEMP/RH% | | 76/15 | 80/54 | 76/30 | 78/68 | 78/65 | 78/63 | 86/56 | 80/48 | 79/42 | 74/24 | 76/33 | 74/38 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-5. DATA SUMMARY, CERAMIC CAPACITORS (CK) (Cont.)

TYPE CK — CAPACITOR SUMMARY--% CHANGE — LIMIT 15.00

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCK | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/02/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .76- | .68- | 2.55- | 2.27- | 1.86- | 2.21- | 2.91 | 12.39 | 1.12 | 3.99 | 2.06 | 2.17- |
| MEAN VAL | 101.5 | 101.5 | 99.6 | 99.9 | 100.4 | 100.0 | 105.2 | 114.9 | 103.4 | 106.4 | 104.4 | 100.0 |
| STD DEV | 4.6 | 5.8 | 5.8 | 5.2 | 4.0 | 5.3 | 6.0 | 8.0 | 6.1 | 8.4 | 9.5 | 6.7 |
| % VAR | 4.53 | 5.71 | 5.82 | 5.21 | 3.98 | 5.30 | 5.70 | 6.96 | 5.90 | 7.89 | 9.10 | 6.70 |
| TEMP/RH% | 84/68 | 86/59 | 86/60 | 84/70 | 86/70 | 90/55 | 80/97 | 80/96 | 80/88 | 75/96 | 81/84 | 84/82 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 6/25 | 5/25 | 2/25 | 6/25 | 10/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 3/25 | 19/25 | 1/25 | 15/25 | 2/25 | 0/25 |
| JECK | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | 4.26 | 4.57 | 4.08 | 3.18 | 2.60 | 2.59 | 8.49 | 10.89 | 10.89 | 20.11 | 84.22 | 8.30 |
| MEAN VAL | 102.7 | 103.0 | 102.5 | 101.7 | 101.1 | 101.1 | 106.8 | 109.2 | 109.1 | 118.6 | 181.7 | 107.0 |
| STD DEV | 6.4 | 7.4 | 7.0 | 6.3 | 5.9 | 6.8 | 10.4 | 22.5 | 12.5 | 16.3 | 55.3 | 17.0 |
| % VAR | 6.23 | 7.18 | 6.83 | 6.19 | 5.84 | 6.73 | 9.74 | 20.60 | 11.46 | 13.74 | 30.43 | 15.89 |
| TEMP/RH% | 84/65 | 84/64 | 85/65 | 86/64 | 85/75 | 90/55 | 76/97 | 86/90 | 88/62 | 77/97 | 78/96 | 85/74 |
| FAIL D | 3/25 | 4/25 | 2/25 | 2/25 | 2/25 | 3/25 | 7/25 | 8/25 | 6/25 | 1/24 | 1/25 | 7/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 7/25 | 12/25 | 7/25 | 22/24 | 24/25 | 2/25 |
| SCK | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/30/65 | 06/10/65 | 07/06/65 | 07/23/65 | 09/01/65 | 10/05/65 | 10/28/65 |
| AVE % CH | 158.90 | 113.58 | 5.17 | .73 | .16- | 7.73 | 22.61 | 107.41 | 63.88 | 49.84 | 5.57- | 2.91- |
| MEAN VAL | 261.0 | 216.0 | 106.0 | 102.1 | 100.7 | 108.5 | 123.5 | 208.9 | 165.4 | 149.2 | 95.1 | 97.9 |
| STD DEV | 55.9 | 46.2 | 16.4 | 42.5 | 6.4 | 9.4 | 15.5 | 84.5 | 48.9 | 43.6 | 16.6 | 4.2 |
| % VAR | 21.42 | 21.39 | 15.47 | 41.63 | 6.36 | 8.66 | 12.55 | 40.45 | 29.56 | 29.22 | 17.46 | 4.29 |
| TEMP/RH% | 78/90 | 85/62 | 84/60 | 85/80 | 89/56 | 89/62 | 81/92 | 82/87 | 71/97 | 86/62 | 83/84 | 80/78 |
| FAIL D | 0/25 | 0/25 | 6/25 | 8/25 | 3/25 | 7/25 | 2/25 | 0/25 | 0/25 | 1/05 | 0/25 | 0/25 |
| FAIL C | 25/25 | 25/25 | 13/25 | 13/25 | 1/25 | 16/25 | 23/25 | 25/25 | 25/25 | 4/05 | 1/25 | 0/25 |
| SECK | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 10/05/65 | 10/28/65 | 11/18/65 |
| AVE % CH | 39.84 | 16.40 | 16.92 | 28.94 | 16.53 | 15.61 | 22.56 | 63.32 | 70.52 | .09- | .35 | .52- |
| MEAN VAL | 139.4 | 116.0 | 116.3 | 128.2 | 116.1 | 115.1 | 121.8 | 163.4 | 168.9 | 99.6 | 100.0 | 99.1 |
| STD DEV | 26.9 | 29.1 | 27.6 | 33.7 | 12.3 | 15.5 | 15.3 | 61.8 | 74.6 | 6.0 | 5.1 | 6.5 |
| % VAR | 19.30 | 25.09 | 23.73 | 26.29 | 10.59 | 13.47 | 12.56 | 37.82 | 44.17 | 6.02 | 5.10 | 6.56 |
| TEMP/RH% | 75/00 | 86/64 | 84/66 | 88/70 | 86/63 | 82/76 | 79/97 | 79/96 | 80/90 | 86/70 | 80/78 | 76/86 |
| FAIL D | 0/25 | 4/25 | 4/25 | 7/25 | 4/25 | 3/25 | 5/25 | 2/20 | 4/25 | 1/25 | 4/25 | 4/25 |
| FAIL C | 25/25 | 21/25 | 17/25 | 16/25 | 16/25 | 16/25 | 19/25 | 18/20 | 20/25 | 0/25 | 0/25 | 0/25 |
| CCK | 02/20/65 | 03/19/65 | 04/10/65 | 06/22/65 | 07/16/65 | 08/16/65 | 09/17/65 | 10/07/65 | 10/27/65 | 11/11/65 | 12/07/65 | 12/27/65 |
| AVE % CH | .05- | 1.02 | .74 | .92- | .36- | .72 | .28 | .11 | 3.09- | .13 | 3.55 | 3.14- |
| MEAN VAL | 99.9 | 100.9 | 100.6 | 99.0 | 99.6 | 100.6 | 100.2 | 100.0 | 96.8 | 100.0 | 103.4 | 96.8 |
| STD DEV | 2.7 | 4.7 | 5.3 | 3.8 | 2.5 | 4.4 | 3.9 | 4.6 | 13.8 | 4.8 | 13.7 | 13.4 |
| % VAR | 2.70 | 4.66 | 5.27 | 3.84 | 2.51 | 4.37 | 3.89 | 4.60 | 14.26 | 4.80 | 13.25 | 13.84 |
| TEMP/RH% | 74/20 | 78/30 | 78/34 | 73/69 | 73/58 | 71/63 | 72/70 | 74/53 | 71/38 | 82/34 | 78/22 | 77/22 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 1/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 1/50 | 0/50 | 1/50 | 1/50 |

## TABLE B-5. DATA SUMMARY, CERAMIC CAPACITORS (CK) (Cont.)

TYPE CK — CAPACITOR SUMMARY--% CHANGE — LIMIT DF LIM 15.00

| JCK | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 1.07- | 1.62- | 5.45 | 3.66- | 3.49- | 3.47- | 3.46- | 4.44- | 1.50- | 2.00- |
| MEAN VAL | 101.1 | 100.6 | 107.8 | 98.5 | 98.7 | 98.7 | 98.7 | 97.7 | 100.7 | 100.2 |
| STD DEV | 9.0 | 8.5 | 13.3 | 4.4 | 4.2 | 4.6 | 4.8 | 4.7 | 6.0 | 4.7 |
| % VAR | 8.90 | 8.45 | 12.34 | 4.47 | 4.26 | 4.66 | 4.86 | 4.81 | 5.96 | 4.69 |
| TEMP/RH% | 80/68 | 78/92 | 79/90 | 79/86 | 82/76 | 85/70 | 78/90 | 84/68 | 80/68 | 72/46 |
| FAIL D | 2/25 | 4/25 | 4/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 1/25 | 1/25 | 5/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 |

| JECK | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 13.83 | 13.05 | 24.77 | 7.06 | 5.49 | 4.96 | 4.32 | 3.62 | 12.08 | 2.05 |
| MEAN VAL | 112.6 | 111.9 | 123.3 | 105.8 | 104.3 | 103.7 | 102.8 | 102.1 | 110.5 | 100.6 |
| STD DEV | 20.9 | 20.1 | 25.0 | 13.3 | 10.8 | 10.5 | 9.3 | 9.1 | 16.7 | 6.2 |
| % VAR | 18.56 | 17.96 | 20.28 | 12.57 | 10.35 | 10.13 | 9.05 | 8.91 | 15.11 | 6.16 |
| TEMP/RH% | 82/68 | 79/90 | 84/70 | 81/80 | 84/66 | 82/78 | 79/88 | 87/62 | 82/68 | 72/46 |
| FAIL D | 6/25 | 6/25 | 1/24 | 6/24 | 4/25 | 2/25 | 3/25 | 3/25 | 8/25 | 0/25 |
| FAIL C | 7/25 | 7/25 | 11/24 | 2/24 | 2/25 | 2/25 | 1/25 | 1/25 | 5/25 | 0/25 |

| SCK | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 3.27- | 5.56- | 10.77 | 3.54- | 6.25- | 5.84- | 4.68- | 4.44- | 3.61- |
| MEAN VAL | 97.5 | 95.2 | 111.8 | 97.2 | 94.5 | 94.9 | 96.1 | 96.3 | 97.1 |
| STD DEV | 3.8 | 18.3 | 21.5 | 8.2 | 18.6 | 18.8 | 14.2 | 14.0 | 18.6 |
| % VAR | 3.90 | 19.22 | 19.23 | 8.44 | 19.68 | 19.81 | 14.78 | 14.54 | 19.16 |
| TEMP/RH% | 74/92 | 82/70 | 79/86 | 84/66 | 81/72 | 80/84 | 84/77 | 85/76 | 66/52 |
| FAIL D | 0/25 | 0/25 | 8/25 | 1/25 | 0/25 | 2/25 | 0/25 | 1/25 | 0/25 |
| FAIL C | 0/25 | 1/25 | 9/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 |

| SECK | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
|---|---|---|---|---|---|---|---|---|
| AVE % CH | .95 | .63 | .21 | .45- | .02 | .20- | .85- | 2.51 |
| MEAN VAL | 100.6 | 100.3 | 99.6 | 99.0 | 99.4 | 99.6 | 99.0 | 102.3 |
| STD DEV | 5.9 | 5.6 | 5.6 | 4.9 | 6.3 | 5.2 | 4.8 | 5.3 |
| % VAR | 5.86 | 5.58 | 5.62 | 4.95 | 6.34 | 5.22 | 4.85 | 5.18 |
| TEMP/RH% | 84/70 | 82/78 | 80/78 | 78/78 | 80/78 | 87/72 | 80/98 | 66/50 |
| FAIL D | 3/25 | 2/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 2/25 | 2/25 | 2/25 |

| CCK | 01/19/66 | 02/04/66 | 02/24/66 | 03/29/66 | 05/18/66 |
|---|---|---|---|---|---|
| AVE % CH | 4.04- | 3.29- | .59 | 1.73 | .15- |
| MEAN VAL | 95.9 | 96.6 | 100.5 | 101.6 | 99.8 |
| STD DEV | 3.4 | 4.4 | 3.8 | 4.5 | 3.4 |
| % VAR | 3.55 | 4.55 | 3.78 | 4.43 | 3.41 |
| TEMP/RH% | 72/21 | 78/47 | 72/58 | 70/46 | 77/96 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

# TABLE B-6. DATA SUMMARY, MYLAR CAPACITORS (CT)

TYPE CT — CAPACITOR SUMMARY--% CHANGE — LIMIT 6.00

| JCT | | 06/20/64 | 06/25/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/20/64 | 11/09/64 | 11/30/64 | 12/23/64 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | | .06 | .03 | .64 | 1.05 | 1.56 | 1.84 | 2.07 | 2.10 | 2.31 | 2.40 | 2.68 |
| MEAN VAL | 98.86 | 98.86 | 98.92 | 98.89 | 99.49 | 99.90 | 100.40 | 100.68 | 100.91 | 100.93 | 101.15 | 101.23 | 101.50 |
| STD DEV | 1.75 | 1.54 | 1.89 | 1.82 | 1.60 | 1.47 | 1.74 | 1.55 | 1.53 | 1.86 | 1.60 | 1.65 | 2.00 |
| % VAR | 1.77 | 1.56 | 1.91 | 1.84 | 1.61 | 1.47 | 1.73 | 1.54 | 1.52 | 1.84 | 1.58 | 1.63 | 1.97 |
| TEMP/RH% | | 77/97 | 82/79 | 84/88 | 80/86 | 82/68 | 88/62 | 85/79 | 90/68 | 75/98 | 84/84 | 80/85 | 86/66 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JECT | | 06/20/64 | 06/23/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .01 | .04 | .08- | .30 | .66 | 1.09 | 1.34 | 1.62 | 1.68 | 1.93 | 2.00 | 2.18 |
| MEAN VAL | 98.13 | 98.15 | 98.18 | 98.06 | 98.43 | 98.78 | 99.21 | 99.45 | 99.73 | 99.78 | 100.03 | 100.10 | 100.28 |
| STD DEV | 2.54 | 2.31 | 2.23 | 2.27 | 2.52 | 2.51 | 2.51 | 2.54 | 2.35 | 2.63 | 2.40 | 2.57 | 2.70 |
| % VAR | 2.59 | 2.35 | 2.27 | 2.31 | 2.56 | 2.54 | 2.53 | 2.55 | 2.36 | 2.64 | 2.40 | 2.57 | 2.69 |
| TEMP/RH% | | 80/72 | 86/68 | 86/72 | 83/78 | 82/72 | 90/60 | 89/74 | 91/65 | 72/00 | 88/76 | 80/86 | 88/63 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SCT | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | .18- | .04- | .02 | .50 | .90 | 1.24 | 1.59 | 1.70 | 1.79 | 1.97 | 2.05 | 2.46 |
| MEAN VAL | 98.32 | 98.14 | 98.28 | 98.34 | 98.82 | 99.21 | 99.54 | 99.89 | 99.99 | 100.08 | 100.26 | 100.34 | 100.74 |
| STD DEV | 2.39 | 2.40 | 2.47 | 2.49 | 2.18 | 2.44 | 2.43 | 2.38 | 2.51 | 2.42 | 2.62 | 2.23 | 2.67 |
| % VAR | 2.43 | 2.45 | 2.51 | 2.53 | 2.21 | 2.46 | 2.44 | 2.38 | 2.51 | 2.42 | 2.61 | 2.22 | 2.65 |
| TEMP/RH% | | 79/98 | 80/94 | 83/78 | 86/65 | 90/58 | 84/68 | 95/70 | 88/74 | 78/88 | 86/84 | 80/86 | 82/67 |
| FAIL D | | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SECT | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | .03 | .02- | .01 | .46 | .92 | 1.32 | 1.54 | 1.74 | 1.77 | 2.00 | 2.04 | 2.24 |
| MEAN VAL | 98.67 | 98.70 | 98.65 | 98.67 | 99.13 | 99.57 | 99.97 | 100.19 | 100.38 | 100.42 | 100.65 | 100.68 | 100.88 |
| STD DEV | 1.89 | 1.64 | 1.70 | 2.12 | 1.79 | 2.19 | 1.93 | 2.03 | 2.16 | 1.96 | 1.85 | 2.06 | 2.11 |
| % VAR | 1.92 | 1.66 | 1.72 | 2.15 | 1.81 | 2.20 | 1.93 | 2.03 | 2.15 | 1.95 | 1.84 | 2.05 | 2.09 |
| TEMP/RH% | | 84/76 | 84/77 | 74/00 | 82/78 | 90/62 | 82/80 | 92/78 | 89/69 | 74/00 | 85/84 | 80/84 | 83/66 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CCT | | 03/25/64 | 06/11/64 | 07/13/64 | 07/30/64 | 08/21/64 | 09/10/64 | 10/03/64 | 10/29/64 | 11/30/64 | 12/17/64 | 01/07/65 | 01/26/65 |
| AVE % CH | | .02 | .67 | .99 | 1.14 | 1.23 | 1.31 | 1.24 | .96 | .79 | .48 | .43 | .27 |
| MEAN VAL | 97.99 | 98.01 | 98.65 | 98.96 | 99.11 | 99.20 | 99.28 | 99.21 | 98.94 | 98.76 | 98.47 | 98.42 | 98.26 |
| STD DEV | 1.85 | 1.81 | 1.46 | 1.72 | 1.72 | 1.86 | 1.77 | 1.63 | 1.49 | 1.48 | 1.37 | 1.63 | 1.72 |
| % VAR | 1.89 | 1.85 | 1.48 | 1.74 | 1.74 | 1.88 | 1.78 | 1.64 | 1.51 | 1.50 | 1.39 | 1.66 | 1.75 |
| TEMP/RH% | | 77/43 | 81/48 | 77/60 | 82/64 | 82/62 | 78/65 | 80/58 | 78/46 | 80/30 | 73/42 | 74/34 | 74/38 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

TABLE B-6. DATA SUMMARY, MYLAR CAPACITORS (CT) (Cont.)

TYPE CT — CAPACITOR SUMMARY--% CHANGE — LIMIT 6.00

| JCT | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/02/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 2.58 | 2.60 | 2.62 | 2.58 | 2.58 | 2.58 | 2.62 | 2.71 | 2.93 | 2.74 | 3.03 | 3.13 |
| MEAN VAL | 101.41 | 101.43 | 101.45 | 101.41 | 101.41 | 101.41 | 101.45 | 101.54 | 101.75 | 101.57 | 101.85 | 101.95 |
| STD DEV | 1.71 | 2.01 | 1.81 | 1.83 | 1.67 | 1.67 | 2.00 | 1.73 | 1.95 | 1.58 | 1.91 | 1.89 |
| % VAR | 1.69 | 1.98 | 1.78 | 1.80 | 1.65 | 1.65 | 1.97 | 1.70 | 1.92 | 1.56 | 1.88 | 1.85 |
| TEMP/RH% | 85/74 | 86/59 | 83/64 | 85/69 | 87/68 | 89/55 | 81/94 | 80/96 | 84/76 | 76/97 | 84/76 | 84/74 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **JECT** | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/02/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | 2.33 | 2.39 | 2.44 | 2.48 | 2.41 | 2.49 | 2.48 | 2.46 | 2.83 | 2.80 | 3.03 | 2.98 |
| MEAN VAL | 100.43 | 100.48 | 100.53 | 100.57 | 100.50 | 100.58 | 100.57 | 100.55 | 100.91 | 100.89 | 101.11 | 101.06 |
| STD DEV | 2.40 | 2.61 | 2.64 | 2.31 | 2.74 | 2.62 | 2.50 | 2.64 | 2.48 | 2.29 | 2.63 | 2.49 |
| % VAR | 2.39 | 2.60 | 2.63 | 2.30 | 2.73 | 2.60 | 2.49 | 2.63 | 2.46 | 2.27 | 2.60 | 2.46 |
| TEMP/RH% | 86/65 | 84/66 | 85/60 | 87/63 | 87/69 | 88/60 | 78/96 | 81/96 | 86/68 | 77/96 | 80/84 | 85/72 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **SCT** | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/30/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | 2.28 | 2.41 | 2.46 | 2.50 | 2.55 | 2.51 | 2.63 | 2.60 | 2.61 | 2.61 | 2.67 | 2.82 |
| MEAN VAL | 100.56 | 100.69 | 100.74 | 100.78 | 100.83 | 100.79 | 100.90 | 100.88 | 100.89 | 100.89 | 100.94 | 101.10 |
| STD DEV | 2.59 | 2.39 | 2.40 | 2.57 | 2.21 | 2.36 | 2.59 | 2.37 | 2.42 | 2.31 | 2.53 | 2.21 |
| % VAR | 2.58 | 2.37 | 2.38 | 2.55 | 2.19 | 2.34 | 2.57 | 2.35 | 2.40 | 2.29 | 2.51 | 2.19 |
| TEMP/RH% | 80/78 | 83/74 | 83/70 | 86/78 | 89/56 | 88/60 | 83/91 | 83/86 | 72/96 | 82/84 | 85/62 | 85/72 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 1/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **SECT** | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | 2.17 | 2.34 | 2.40 | 2.43 | 2.43 | 2.43 | 2.41 | 2.34 | 2.51 | 2.77 | 2.63 | 2.64 |
| MEAN VAL | 100.81 | 100.98 | 101.04 | 101.06 | 101.07 | 101.06 | 101.05 | 100.97 | 101.14 | 101.39 | 101.27 | 101.27 |
| STD DEV | 2.14 | 2.01 | 1.95 | 2.18 | 1.80 | 2.16 | 1.80 | 2.03 | 2.08 | 2.52 | 1.77 | 2.13 |
| % VAR | 2.12 | 1.99 | 1.93 | 2.16 | 1.78 | 2.14 | 1.78 | 2.01 | 2.06 | 2.49 | 1.75 | 2.10 |
| TEMP/RH% | 77/94 | 86/66 | 85/59 | 87/70 | 87/60 | 84/65 | 85/74 | 82/86 | 84/74 | 80/84 | 85/66 | 86/74 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 2/25 | 5/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| **CCT** | 02/20/65 | 03/19/65 | 04/10/65 | 06/22/65 | 07/19/65 | 08/23/65 | 09/17/65 | 10/07/65 | 10/28/65 | 11/11/65 | 12/07/65 | 12/28/65 |
| AVE % CH | .16 | .06 | .03 | .86 | 1.16 | 1.34 | 1.45 | 1.42 | 1.21 | 1.01 | .56 | .36 |
| MEAN VAL | 98.15 | 98.05 | 98.02 | 98.83 | 99.12 | 99.30 | 99.41 | 99.38 | 99.17 | 98.98 | 98.55 | 98.35 |
| STD DEV | 1.93 | 1.54 | 1.56 | 1.75 | 1.97 | 1.79 | 1.77 | 1.87 | 1.89 | 1.83 | 1.56 | 1.46 |
| % VAR | 1.97 | 1.57 | 1.59 | 1.77 | 1.99 | 1.80 | 1.78 | 1.88 | 1.91 | 1.85 | 1.58 | 1.48 |
| TEMP/RH% | 74/20 | 78/23 | 78/34 | 73/69 | 72/63 | 74/68 | 72/70 | 74/58 | 76/32 | 83/36 | 77/22 | 80/22 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 1/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-6 DATA SUMMARY, MYLAR CAPACITORS (CT) (Cont.)

CAPACITOR SUMMARY--% CHANGE

LIMIT 6.00
DF LIM

| TYPE CT | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| JCT | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | 3.09 | 3.09 | 3.19 | 3.16 | 3.11 | 3.04 | 2.90 | 2.92 | 3.02 | 2.40 |
| MEAN VAL | 101.91 | 101.91 | 102.02 | 101.98 | 101.93 | 101.87 | 101.73 | 101.74 | 101.85 | 101.23 |
| STD DEV | 1.81 | 1.92 | 1.61 | 1.87 | 1.93 | 1.70 | 1.68 | 2.03 | 1.93 | 2.02 |
| % VAR | 1.78 | 1.88 | 1.58 | 1.83 | 1.89 | 1.67 | 1.65 | 2.00 | 1.89 | 2.00 |
| TEMP/RH% | 81/68 | 78/88 | 82/80 | 80/84 | 83/70 | 86/68 | 79/90 | 86/62 | 82/70 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JECT | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | 2.93 | 2.95 | 3.13 | 3.17 | 3.13 | 3.03 | 2.99 | 3.00 | 3.03 | 2.64 |
| MEAN VAL | 101.01 | 101.03 | 101.20 | 101.24 | 101.20 | 101.11 | 101.07 | 101.08 | 101.11 | 100.73 |
| STD DEV | 2.39 | 2.37 | 2.57 | 2.54 | 2.57 | 2.27 | 2.46 | 2.40 | 2.33 | 2.34 |
| % VAR | 2.37 | 2.35 | 2.54 | 2.51 | 2.54 | 2.25 | 2.43 | 2.37 | 2.30 | 2.32 |
| TEMP/RH% | 83/64 | 78/88 | 84/74 | 82/78 | 86/60 | 83/78 | 80/86 | 88/58 | 83/68 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SCT | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | 2.75 | 2.79 | 2.88 | 2.89 | 2.89 | 2.84 | 2.85 | 2.85 | 2.96 | 2.14 |
| MEAN VAL | 101.02 | 101.07 | 101.16 | 101.17 | 101.16 | 101.12 | 101.12 | 101.13 | 101.24 | 100.43 |
| STD DEV | 2.49 | 2.22 | 2.24 | 2.31 | 2.59 | 2.30 | 2.52 | 2.22 | 2.21 | 2.35 |
| % VAR | 2.46 | 2.20 | 2.21 | 2.28 | 2.56 | 2.27 | 2.49 | 2.20 | 2.18 | 2.34 |
| TEMP/RH% | 82/84 | 74/92 | 82/70 | 81/80 | 85/62 | 82/66 | 81/79 | 86/75 | 86/72 | 66/52 |
| FAIL D | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 3/25 | 0/25 |
| FAIL C | 2/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 |
| SECT | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | 2.62 | 2.62 | 2.65 | 2.70 | 2.72 | 2.68 | 2.75 | 2.77 | 2.81 | 1.99 |
| MEAN VAL | 101.26 | 101.25 | 101.28 | 101.33 | 101.35 | 101.32 | 101.38 | 101.40 | 101.36 | 100.63 |
| STD DEV | 1.84 | 1.94 | 1.96 | 2.16 | 2.18 | 1.82 | 2.15 | 1.87 | 2.05 | 1.87 |
| % VAR | 1.82 | 1.92 | 1.94 | 2.13 | 2.15 | 1.80 | 2.12 | 1.84 | 2.02 | 1.86 |
| TEMP/RH% | 81/84 | 76/84 | 84/68 | 84/76 | 82/72 | 79/73 | 84/72 | 88/68 | 84/84 | 66/50 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 3/24 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/24 | 0/25 |
| CCT | 01/18/66 | 02/04/66 | 02/24/66 | 03/28/66 | 05/18/66 | | | | | |
| AVE % CH | .16 | .08- | .02 | .13 | .48 | | | | | |
| MEAN VAL | 98.15 | 97.91 | 98.01 | 98.12 | 98.46 | | | | | |
| STD DEV | 1.77 | 2.03 | 1.64 | 1.84 | 1.92 | | | | | |
| % VAR | 1.80 | 2.07 | 1.67 | 1.88 | 1.95 | | | | | |
| TEMP/RH% | 72/21 | 79/47 | 69/60 | 72/44 | 76/66 | | | | | |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | | |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | | |

## TABLE B-7. DATA SUMMARY, MICA CAPACITORS (CM)

TYPE CM — CAPACITOR SUMMARY--% CHANGE — LIMIT 1.50

| JCM | | 06/20/64 | 06/23/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/20/64 | 11/09/64 | 11/30/64 | 12/23/64 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .01- | .13 | .09- | .54- | .61- | .81- | .79- | .83- | .82- | .84- | .98- | .69- |
| MEAN VAL | 2.116 | 2.116 | 2.119 | 2.114 | 2.105 | 2.103 | 2.099 | 2.099 | 2.098 | 2.099 | 2.098 | 2.095 | 2.101 |
| STD DEV | .014 | .034 | .027 | .017 | .038 | .032 | .021 | .043 | .046 | .036 | .045 | .042 | .043 |
| % VAR | .66 | 1.61 | 1.27 | .80 | 1.81 | 1.52 | 1.00 | 2.05 | 2.19 | 1.72 | 2.14 | 2.00 | 2.05 |
| TEMP/RH% | | 75/98 | 78/94 | 82/84 | 80/84 | 82/76 | 85/70 | 86/84 | 92/67 | 74/96 | 85/80 | 82/83 | 87/66 |
| FAIL D | | 0/25 | 2/25 | 2/25 | 0/25 | 1/25 | 5/25 | 5/25 | 6/25 | 5/25 | 6/25 | 8/25 | 6/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 1/25 | 0/25 |
| JECM | | 06/20/64 | 06/23/64 | 06/29/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/10/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | .13- | .15- | .33- | .61- | .57- | .65- | .88- | .92- | .90- | .99- | 1.10- | .35- |
| MEAN VAL | 2.114 | 2.111 | 2.110 | 2.107 | 2.101 | 2.102 | 2.100 | 2.095 | 2.094 | 2.095 | 2.093 | 2.090 | 2.106 |
| STD DEV | .038 | .017 | .041 | .034 | .029 | .033 | .010 | .027 | .033 | .037 | .025 | .046 | .050 |
| % VAR | 1.80 | .81 | 1.94 | 1.61 | 1.38 | 1.57 | .48 | 1.29 | 1.58 | 1.77 | 1.19 | 2.20 | 2.37 |
| TEMP/RH% | | 79/79 | 85/80 | 86/72 | 82/84 | 82/70 | 91/58 | 85/80 | 89/68 | 75/00 | 86/78 | 79/90 | 89/61 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 2/25 | 5/25 | 6/25 | 6/25 | 7/25 | 7/25 | 6/25 | 5/25 | 7/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 1/25 | 3/25 | 2/25 |
| SCM | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | | .15- | .36- | .55- | .31- | .33- | .47- | .51- | .51- | .63- | .56- | .38- |
| MEAN VAL | 2.109 | 2.109 | 2.106 | 2.101 | 2.097 | 2.102 | 2.102 | 2.099 | 2.098 | 2.098 | 2.095 | 2.097 | 2.101 |
| STD DEV | .029 | .034 | .039 | .026 | .031 | .033 | .019 | .014 | .018 | .019 | .046 | .011 | .018 |
| % VAR | 1.38 | 1.61 | 1.85 | 1.24 | 1.48 | 1.57 | .90 | .67 | .86 | .91 | 2.20 | .52 | .86 |
| TEMP/RH% | | 78/98 | 80/00 | 80/87 | 83/76 | 90/60 | 84/68 | 90/80 | 90/68 | 78/88 | 86/79 | 83/80 | 83/62 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 1/25 | 2/25 | 2/25 | 4/25 | 1/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SECM | | 06/22/64 | 06/25/64 | 07/01/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/28/64 |
| AVE % CH | | .05- | .59- | .51- | .52- | .42- | .48- | .62- | .68- | .67- | .85- | .86- | .60- |
| MEAN VAL | 2.113 | 2.112 | 2.100 | 2.102 | 2.102 | 2.104 | 2.103 | 2.100 | 2.098 | 2.099 | 2.095 | 2.095 | 2.100 |
| STD DEV | .038 | .043 | .030 | .022 | .031 | .018 | .043 | .036 | .042 | .039 | .027 | .038 | .010 |
| % VAR | 1.80 | 2.04 | 1.43 | 1.05 | 1.47 | .86 | 2.04 | 1.71 | 2.00 | 1.86 | 1.29 | 1.81 | .48 |
| TEMP/RH% | | 84/74 | 84/82 | 74/00 | 80/80 | 89/62 | 82/82 | 94/72 | 87/76 | 73/00 | 83/86 | 81/84 | 82/67 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 2/25 | 2/25 | 4/25 | 6/25 | 8/25 | 2/25 |
| FAIL C | | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CCM | | 03/03/64 | 06/11/64 | 07/14/64 | 07/29/64 | 08/21/64 | 09/10/64 | 10/03/64 | 10/29/64 | 11/27/64 | 12/16/64 | 01/07/65 | 01/25/65 |
| AVE % CH | | .11 | .08 | .38 | .34 | .41 | .44 | .29 | .46 | .45 | .48 | .47 | .46 |
| MEAN VAL | 2.108 | 2.110 | 2.110 | 2.116 | 2.115 | 2.117 | 2.117 | 2.114 | 2.118 | 2.117 | 2.118 | 2.118 | 2.118 |
| STD DEV | .004 | .042 | .036 | .017 | .028 | .039 | .030 | .027 | .035 | .045 | .019 | .006 | .034 |
| % VAR | .19 | 1.99 | 1.71 | .80 | 1.32 | 1.84 | 1.42 | 1.28 | 1.65 | 2.13 | .90 | .28 | 1.61 |
| TEMP/RH% | | 74/15 | 80/54 | 77/60 | 75/68 | 82/63 | 78/65 | 84/57 | 80/47 | 79/42 | 74/26 | 74/34 | 74/38 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-7. DATA SUMMARY, MICA CAPACITORS (CM) (Cont.)

TYPE CM — CAPACITOR SUMMARY--% CHANGE — LIMIT 1.50

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JCM | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/02/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .72- | .76- | .83- | .79- | .75- | .81- | .59- | .26- | .66- | .67- | .58- | .74- |
| MEAN VAL | 2.101 | 2.100 | 2.098 | 2.099 | 2.100 | 2.099 | 2.104 | 2.110 | 2.102 | 2.102 | 2.104 | 2.100 |
| STD DEV | .028 | .015 | .049 | .044 | .027 | .008 | .041 | .049 | .026 | .012 | .020 | .043 |
| % VAR | 1.33 | .71 | 2.34 | 2.10 | 1.29 | .38 | 1.95 | 2.32 | 1.24 | .57 | .95 | 2.05 |
| TEMP/RH% | 85/67 | 86/59 | 86/60 | 85/69 | 87/66 | 90/52 | 80/96 | 80/96 | 82/80 | 76/96 | 82/82 | 84/78 |
| FAIL D | 6/25 | 6/25 | 6/25 | 5/25 | 5/25 | 6/25 | 6/25 | 3/25 | 5/25 | 6/25 | 5/25 | 7/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 |
| JECM | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .60- | 2.98 | .85- | .79- | .77- | .81- | .20- | .53- | .77- | .52- | .47- | 4.45- |
| MEAN VAL | 2.101 | 2.177 | 2.096 | 2.097 | 2.097 | 2.096 | 2.109 | 2.102 | 2.097 | 2.103 | 2.104 | 2.020 |
| STD DEV | .023 | .301 | .030 | .012 | .046 | .049 | .046 | .048 | .043 | .006 | .029 | .411 |
| % VAR | 1.09 | 13.83 | 1.43 | .57 | 2.19 | 2.34 | 2.18 | 2.28 | 2.05 | .29 | 1.38 | 20.35 |
| TEMP/RH% | 85/64 | 84/60 | 85/62 | 86/66 | 85/72 | 89/63 | 75/96 | 86/84 | 88/62 | 76/96 | 78/94 | 84/75 |
| FAIL D | 7/25 | 7/25 | 7/25 | 7/25 | 7/25 | 7/25 | 5/24 | 5/24 | 7/25 | 5/24 | 6/25 | 6/25 |
| FAIL C | 3/25 | 3/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/24 | 1/24 | 0/25 | 3/24 | 2/25 | 3/25 |
| SCM | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/30/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .30- | .39- | .34- | .36- | .36- | .38- | .35- | 9.27 | .23- | .17- | .05 | .43- |
| MEAN VAL | 2.102 | 2.101 | 2.102 | 2.101 | 2.101 | 2.101 | 2.102 | 2.304 | 2.104 | 2.105 | 2.110 | 2.100 |
| STD DEV | .047 | .041 | .036 | .032 | .027 | .028 | .042 | .323 | .002 | .029 | .012 | .028 |
| % VAR | 2.24 | 1.95 | 1.71 | 1.52 | 1.29 | 1.33 | 2.00 | 14.02 | .10 | 1.38 | .57 | 1.33 |
| TEMP/RH% | 79/82 | 85/69 | 85/60 | 86/75 | 89/55 | 89/62 | 82/86 | 82/87 | 71/97 | 82/78 | 86/62 | 82/84 |
| FAIL D | 3/25 | 2/25 | 2/25 | 2/25 | 1/25 | 1/25 | 2/25 | 2/25 | 8/25 | 10/25 | 8/25 | 2/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 13/25 | 2/25 | 2/25 | 4/25 | 0/25 |
| SECM | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .54- | .01- | .70- | .44- | .49- | .47- | .55- | .48- | .12- | 3.34 | 19.22 | .85- |
| MEAN VAL | 2.101 | 2.112 | 2.098 | 2.103 | 2.102 | 2.103 | 2.101 | 2.103 | 2.110 | 2.183 | 2.518 | 2.095 |
| STD DEV | .039 | .072 | .008 | .043 | .042 | .032 | .017 | .040 | .035 | .228 | .709 | .035 |
| % VAR | 1.86 | 3.41 | .38 | 2.04 | 2.00 | 1.52 | .81 | 1.90 | 1.66 | 10.44 | 28.16 | 1.67 |
| TEMP/RH% | 76/00 | 86/65 | 84/61 | 88/73 | 87/61 | 82/69 | 84/82 | 80/90 | 82/84 | 78/92 | 83/76 | 86/76 |
| FAIL D | 15/25 | 8/25 | 5/25 | 8/25 | 4/25 | 5/25 | 4/25 | 7/25 | 8/25 | 2/25 | 1/25 | 7/25 |
| FAIL C | 0/25 | 1/25 | 1/25 | 0/25 | 0/25 | 1/25 | 1/25 | 3/25 | 9/25 | 10/25 | 23/25 | 1/25 |
| CCM | 02/20/65 | 03/19/65 | 04/10/65 | 06/22/65 | 07/16/65 | 08/16/65 | 09/17/65 | 10/07/65 | 10/28/65 | 11/11/65 | 12/08/65 | 12/27/65 |
| AVE % CH | .44 | .45 | .41 | .34 | .34 | .37 | .32 | .35 | .37 | .43 | .51 | .43 |
| MEAN VAL | 2.117 | 2.117 | 2.117 | 2.115 | 2.115 | 2.116 | 2.115 | 2.115 | 2.116 | 2.117 | 2.119 | 2.117 |
| STD DEV | .035 | .042 | .041 | .021 | .019 | .035 | .038 | .043 | .024 | .019 | .025 | .022 |
| % VAR | 1.65 | 1.98 | 1.94 | .99 | .90 | 1.65 | 1.80 | 2.03 | 1.13 | .90 | 1.18 | 1.04 |
| TEMP/RH% | 74/20 | 79/28 | 78/34 | 73/73 | 73/58 | 73/58 | 72/70 | 74/55 | 78/30 | 82/34 | 78/22 | 78/22 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-7. DATA SUMMARY, MICA CAPACITORS (CM) (Cont.)

CAPACITOR SUMMARY--% CHANGE

| TYPE CM | | | | | | | | | | | LIMIT 1.50 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JCM | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 | DF LIM |
| AVE % CH | .79- | .81- | .42- | .59- | .73- | .69- | .68- | .77- | .66- | .74- | |
| MEAN VAL | 2.099 | 2.099 | 2.107 | 2.103 | 2.101 | 2.101 | 2.102 | 2.100 | 2.102 | 2.100 | |
| STD DEV | .047 | .019 | .032 | .050 | .029 | .048 | .023 | .027 | .025 | .048 | |
| % VAR | 2.24 | .91 | 1.52 | 2.38 | 1.38 | 2.28 | 1.09 | 1.29 | 1.19 | 2.29 | |
| TEMP/RH% | 80/72 | 76/94 | 80/87 | 79/86 | 82/71 | 83/80 | 78/90 | 85/66 | 82/68 | 72/46 | |
| FAIL D | 8/25 | 8/25 | 4/25 | 6/25 | 3/25 | 6/25 | 6/25 | 6/25 | 4/25 | 5/25 | |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 | 1/25 | 0/25 | 0/25 | |
| JECM | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 | |
| AVE % CH | .83- | 4.82- | .46- | 5.33- | 5.54- | .91- | .40- | 1.09- | .81- | .78- | 1000.00 |
| MEAN VAL | 2.096 | 2.012 | 2.104 | 2.002 | 1.998 | 2.096 | 2.106 | 2.092 | 2.097 | 2.097 | |
| STD DEV | .037 | .408 | .013 | .429 | .438 | .037 | .042 | .028 | .001 | .033 | |
| % VAR | 1.77 | 20.28 | .62 | 21.43 | 21.92 | 1.77 | 1.99 | 1.34 | .05 | 1.57 | |
| TEMP/RH% | 82/68 | 79/90 | 84/72 | 81/80 | 85/62 | 82/76 | 80/84 | 87/62 | 82/68 | 72/76 | |
| FAIL D | 5/25 | 6/25 | 5/23 | 5/22 | 5/25 | 5/25 | 6/25 | 6/25 | 6/25 | 7/25 | |
| FAIL C | 2/25 | 4/25 | 2/23 | 2/22 | 6/25 | 6/25 | 5/25 | 5/25 | 3/25 | 0/25 | |
| SCM | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 | |
| AVE % CH | .57- | .49- | .25- | .20- | .28- | .33- | .26- | .16- | .14- | .25- | |
| MEAN VAL | 2.097 | 2.098 | 2.103 | 2.105 | 2.103 | 2.102 | 2.103 | 2.105 | 2.106 | 2.104 | |
| STD DEV | .026 | .046 | .048 | .037 | .007 | .007 | .042 | .044 | .013 | .043 | |
| % VAR | 1.24 | 2.19 | 2.28 | 1.76 | .33 | .33 | 2.00 | 2.09 | .62 | 2.04 | |
| TEMP/RH% | 81/82 | 74/92 | 82/70 | 80/86 | 84/64 | 81/69 | 82/78 | 85/78 | 85/76 | 66/52 | |
| FAIL D | 5/25 | 3/25 | 2/25 | 3/25 | 2/25 | 2/25 | 2/25 | 2/25 | 2/25 | 2/25 | |
| FAIL C | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 0/25 | |
| SECM | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 | |
| AVE % CH | .94- | 1.11- | .94- | .79- | .74- | .77- | .61- | .62- | .60- | .46- | |
| MEAN VAL | 2.093 | 2.089 | 2.093 | 2.096 | 2.097 | 2.096 | 2.100 | 2.099 | 2.100 | 2.103 | |
| STD DEV | .019 | .026 | .027 | .014 | .018 | .043 | .022 | .046 | .021 | .009 | |
| % VAR | .91 | 1.24 | 1.29 | .67 | .86 | 2.05 | 1.05 | 2.19 | 1.00 | .43 | |
| TEMP/RH% | 82/80 | 76/84 | 84/70 | 83/77 | 81/74 | 78/76 | 83/74 | 88/70 | 82/88 | 66/50 | |
| FAIL D | 8/25 | 9/25 | 7/24 | 7/24 | 6/25 | 6/25 | 4/25 | 4/25 | 4/25 | 2/25 | |
| FAIL C | 1/25 | 1/25 | 0/24 | 0/24 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | |
| CCM | 01/18/66 | 02/04/66 | 02/24/66 | 03/28/66 | 05/18/66 | | | | | | |
| AVE % CH | .41 | .51 | .50 | .45 | .45 | | | | | | |
| MEAN VAL | 2.117 | 2.119 | 2.119 | 2.118 | 2.117 | | | | | | |
| STD DEV | .039 | .031 | .043 | .043 | .044 | | | | | | |
| % VAR | 1.84 | 1.46 | 2.03 | 2.03 | 2.08 | | | | | | |
| TEMP/RH% | 72/21 | 78/47 | 72/58 | 70/46 | 77/64 | | | | | | |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | | | |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | | | | | | |

# TABLE B-8. DATA SUMMARY, INDUCTORS (WE) (INDUCTANCE)

TYPE WE — INDUCTOR SUMMARY--% CHANGE — LIMIT 10.00

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JWE | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | 1.35 | 1.35 | .74 | .76- | .14- | 1.81 | 3.28 | 1.17 | 1.17 | .41 | .65- | 1.26 |
| MEAN VAL | 40.42 | 40.96 | 40.96 | 40.71 | 40.11 | 40.36 | 41.14 | 41.73 | 40.89 | 40.89 | 40.58 | 40.15 | 40.92 |
| STD DEV | .35 | .46 | .49 | .85 | .58 | .58 | .83 | 2.93 | .33 | .80 | .43 | .52 | .83 |
| % VAR | .87 | 1.12 | 1.20 | 2.09 | 1.45 | 1.44 | 2.02 | 7.02 | .81 | 1.96 | 1.06 | 1.30 | 2.03 |
| TEMP/RH% | | 84/88 | 85/76 | 84/79 | 79/95 | 81/74 | 84/70 | 85/88 | 88/72 | 83/84 | 84/82 | 77/92 | 86/61 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JEWE | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | 1.82 | 1.67 | .95 | .68- | .44- | 2.30 | 1.77 | 1.11 | 1.32 | .79 | .13 | .79 |
| MEAN VAL | 40.26 | 41.00 | 40.94 | 40.65 | 39.99 | 40.08 | 41.19 | 40.98 | 40.71 | 40.80 | 40.58 | 40.32 | 40.58 |
| STD DEV | .77 | .17 | .16 | .07 | .52 | .95 | 1.18 | .23 | .57 | .19 | .55 | .34 | .62 |
| % VAR | 1.91 | .41 | .39 | .17 | 1.30 | 2.37 | 2.86 | .56 | 1.40 | .47 | 1.36 | .84 | 1.53 |
| TEMP/RH% | | 82/76 | 83/80 | 84/79 | 79/98 | 80/78 | 85/80 | 82/80 | 87/73 | 84/72 | 85/79 | 76/98 | 89/60 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SWE | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | 1.91 | .94 | 1.00- | 1.22 | 1.51 | 1.57 | 1.11 | 1.07 | 1.52 | .32 | .20 | 1.25- |
| MEAN VAL | 40.48 | 41.25 | 40.85 | 40.07 | 40.97 | 41.09 | 41.11 | 40.92 | 40.91 | 41.09 | 40.60 | 40.55 | 39.97 |
| STD DEV | .36 | .51 | .98 | .64 | .56 | .33 | .61 | .71 | .43 | 2.36 | .78 | .79 | .51 |
| % VAR | .89 | 1.24 | 2.40 | 1.60 | 1.37 | .80 | 1.48 | 1.74 | 1.05 | 5.74 | 1.92 | 1.95 | 1.28 |
| TEMP/RH% | | 78/84 | 87/66 | 83/86 | 85/72 | 85/62 | 84/75 | 88/77 | 87/68 | 80/80 | 83/88 | 84/79 | 86/70 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 |
| SEWE | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | 1.98 | .17 | .37- | 1.26 | 1.34 | 1.10 | .97 | .78 | 1.12 | .20 | .30- | .31- |
| MEAN VAL | 40.34 | 41.13 | 40.40 | 40.18 | 40.84 | 40.88 | 40.78 | 40.72 | 40.65 | 40.79 | 40.42 | 40.21 | 40.21 |
| STD DEV | .59 | .99 | .95 | 1.12 | .84 | .52 | .67 | .94 | .75 | 1.26 | .70 | .96 | 2.56 |
| % VAR | 1.46 | 2.41 | 2.35 | 2.79 | 2.06 | 1.27 | 1.64 | 2.31 | 1.85 | 3.09 | 1.73 | 2.39 | 6.37 |
| TEMP/RH% | | 79/86 | 86/72 | 82/80 | 85/70 | 85/58 | 82/82 | 89/74 | 86/76 | 78/84 | 83/86 | 82/80 | 84/74 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 |
| CWE | | 08/20/64 | 09/09/64 | 09/29/64 | 10/26/64 | 11/24/64 | 12/16/64 | 01/07/65 | 01/22/65 | 02/20/65 | 03/18/65 | 04/10/65 | 06/21/65 |
| AVE % CH | | .17 | .70- | 1.43- | 1.01- | .21- | .14 | .01- | .25- | .12- | .15- | 1.02- | 1.32- |
| MEAN VAL | 39.17 | 39.23 | 38.89 | 38.60 | 38.77 | 39.08 | 39.22 | 39.16 | 39.07 | 39.12 | 39.11 | 38.77 | 38.65 |
| STD DEV | .06 | .66 | .56 | .80 | .44 | .75 | .39 | .50 | .30 | .48 | .24 | .32 | .19 |
| % VAR | .15 | 1.68 | 1.44 | 2.07 | 1.13 | 1.92 | .99 | 1.28 | .77 | 1.23 | .61 | .83 | .49 |
| TEMP/RH% | | 78/56 | 78/60 | 83/56 | 78/40 | 80/27 | 74/24 | 78/30 | 78/38 | 74/21 | 79/30 | 78/34 | 73/62 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-8. DATA SUMMARY, INDUCTORS (WE) (INDUCTANCE) (Cont.)

| TYPE WE | | | | INDUCTOR | SUMMARY--% CHANGE | | | | | | LIMIT | 10.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JWE | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .77 | .66 | .34 | .01- | .31- | .52- | 2.09- | .83- | .44 | .50 | .23- | .03- |
| MEAN VAL | 40.73 | 40.68 | 40.55 | 40.41 | 40.29 | 40.20 | 39.57 | 40.08 | 40.59 | 40.62 | 40.32 | 40.40 |
| STD DEV | .27 | .67 | .78 | .66 | .44 | .54 | 3.27 | .58 | .67 | .26 | .65 | .78 |
| % VAR | .66 | 1.65 | 1.92 | 1.63 | 1.09 | 1.34 | 8.26 | 1.45 | 1.65 | .64 | 1.61 | 1.93 |
| TEMP/RH% | 84/69 | 81/76 | 85/58 | 84/70 | 84/76 | 87/64 | 81/90 | 84/85 | 88/65 | 82/78 | 79/96 | 82/82 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JEWE | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | .75 | .71 | .78 | .08 | .04 | .20 | .50- | .29- | .02 | .28 | .53 | .06- |
| MEAN VAL | 40.57 | 40.55 | 40.58 | 40.30 | 40.28 | 40.34 | 40.07 | 40.15 | 40.27 | 40.37 | 40.48 | 40.24 |
| STD DEV | .13 | .34 | .31 | .23 | .62 | .63 | .56 | .30 | .57 | .68 | .32 | .18 |
| % VAR | .32 | .84 | .76 | .57 | 1.54 | 1.56 | 1.40 | .75 | 1.42 | 1.68 | .79 | .45 |
| TEMP/RH% | 84/60 | 83/68 | 84/62 | 82/78 | 82/84 | 86/64 | 82/78 | 84/92 | 87/66 | 82/78 | 79/96 | 83/80 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SWE | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .37 | 1.01 | 2.93 | 1.23 | 1.32 | .56 | .68 | .15 | .65 | .65 | .67 | .32- |
| MEAN VAL | 40.62 | 40.88 | 41.66 | 40.97 | 41.01 | 40.70 | 40.75 | 40.53 | 40.74 | 40.74 | 40.75 | 40.34 |
| STD DEV | .83 | 1.17 | .64 | .89 | .41 | 1.10 | .51 | .79 | .42 | .42 | .21 | .79 |
| % VAR | 2.04 | 2.86 | 1.54 | 2.17 | 1.00 | 2.70 | 1.25 | 1.95 | 1.03 | 1.03 | .52 | 1.96 |
| TEMP/RH% | 76/00 | 86/66 | 84/62 | 84/76 | 86/64 | 87/64 | 88/72 | 90/74 | 72/96 | 85/68 | 87/60 | 80/94 |
| FAIL D | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SEWE | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .22 | .22 | .72- | .67- | 2.06- | .40 | .94- | .66- | .08 | .65 | .21- | 1.53- |
| MEAN VAL | 40.42 | 40.42 | 40.05 | 40.06 | 39.52 | 40.49 | 39.96 | 40.07 | 40.36 | 40.59 | 40.25 | 39.71 |
| STD DEV | .93 | .99 | .62 | .99 | 3.28 | .93 | .61 | .56 | .75 | .55 | .64 | .68 |
| % VAR | 2.30 | 2.45 | 1.55 | 2.47 | 8.30 | 2.30 | 1.53 | 1.40 | 1.86 | 1.36 | 1.59 | 1.71 |
| TEMP/RH% | 78/83 | 82/70 | 82/66 | 85/80 | 84/67 | 88/60 | 88/70 | 88/74 | 72/96 | 85/70 | 88/60 | 80/94 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CWE | 07/15/65 | 08/16/65 | 09/08/65 | 09/17/65 | 10/07/65 | 10/27/65 | 11/11/65 | 12/07/65 | 12/28/65 | 01/19/66 | 02/04/66 | 02/24/66 |
| AVE % CH | .67- | .80- | 1.45- | .90- | 1.02 | .26- | .82- | 1.06 | .16- | 1.31 | 1.44 | 2.06 |
| MEAN VAL | 38.90 | 38.85 | 38.60 | 38.81 | 39.57 | 39.07 | 38.84 | 39.58 | 39.10 | 39.68 | 39.73 | 39.97 |
| STD DEV | .55 | .64 | .18 | .60 | .31 | .21 | .83 | .60 | .69 | .12 | .45 | .67 |
| % VAR | 1.41 | 1.65 | .47 | 1.55 | .78 | .54 | 2.14 | 1.52 | 1.76 | .30 | 1.13 | 1.68 |
| TEMP/RH% | 74/57 | 71/66 | 72/62 | 72/71 | 75/45 | 72/36 | 82/34 | 79/22 | 80/22 | 73/22 | 78/47 | 72/58 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-8. DATA SUMMARY, INDUCTORS (WE) (INDUCTANCE) (Cont.)

TYPE WE — INDUCTOR SUMMARY--% CHANGE — LIMIT OF LIM 10.00

| JWE | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 1.42- | .41- | .92- | 1.23- | .77- | .98- | .89- | .62- | .23- | .78- |
| MEAN VAL | 39.84 | 40.25 | 40.04 | 39.92 | 40.10 | 40.02 | 40.05 | 40.16 | 40.32 | 40.10 |
| STD DEV | .12 | .30 | .61 | .05 | .62 | .79 | .79 | .75 | .70 | .39 |
| % VAR | .30 | .75 | 1.52 | .13 | 1.55 | 1.97 | 1.97 | 1.87 | 1.74 | .97 |
| TEMP/RH% | 78/92 | 80/80 | 84/72 | 84/76 | 88/54 | 87/56 | 84/67 | 90/57 | 83/67 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |

| JEWE | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .49- | .26- | .34- | .69- | .53- | .43- | .52- | .31- | .17 | .37- |
| MEAN VAL | 40.06 | 40.16 | 40.13 | 39.99 | 40.05 | 40.09 | 40.05 | 40.14 | 40.33 | 40.11 |
| STD DEV | .57 | .56 | .21 | .26 | .51 | .62 | .73 | .27 | .47 | .65 |
| % VAR | 1.42 | 1.39 | .52 | .65 | 1.27 | 1.55 | 1.82 | .67 | 1.17 | 1.62 |
| TEMP/RH% | 78/96 | 79/80 | 84/74 | 84/78 | 88/54 | 86/60 | 84/66 | 90/58 | 83/68 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |

| SWE | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .24- | 4.08- | 4.77- | 4.78- | 4.47- | 4.80- | 4.45- | 4.23- | 4.75- | 3.94- |
| MEAN VAL | 40.38 | 38.82 | 38.54 | 38.54 | 38.66 | 38.53 | 38.67 | 38.76 | 38.55 | 38.88 |
| STD DEV | .21 | 7.86 | 7.88 | 7.86 | 7.86 | 7.80 | 7.86 | 7.86 | 7.82 | 7.88 |
| % VAR | .52 | 20.25 | 20.45 | 20.39 | 20.33 | 20.24 | 20.33 | 20.28 | 20.29 | 20.27 |
| TEMP/RH% | 80/86 | 74/92 | 86/62 | 85/70 | 87/64 | 84/62 | 87/64 | 88/70 | 86/74 | 66/52 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 |

| SEWE | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .75- | .87- | .78- | 1.37- | 1.20- | 1.74- | .61- | 5.49- | 4.96- | .74- |
| MEAN VAL | 40.03 | 39.98 | 40.02 | 39.78 | 39.85 | 39.63 | 40.09 | 38.20 | 38.42 | 40.03 |
| STD DEV | .87 | .93 | .74 | .80 | .84 | .96 | .73 | 7.83 | 7.79 | .88 |
| % VAR | 2.17 | 2.33 | 1.85 | 2.01 | 2.11 | 2.42 | 1.82 | 20.50 | 20.28 | 2.20 |
| TEMP/RH% | 79/94 | 74/94 | 84/68 | 85/70 | 87/64 | 84/62 | 88/62 | 88/73 | 88/66 | 66/52 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 0/25 |

| CWE | 03/29/66 | 05/27/66 |
|---|---|---|
| AVE % CH | 4.40- | 4.38- |
| MEAN VAL | 37.44 | 37.45 |
| STD DEV | .75 | .57 |
| % VAR | 2.00 | 1.52 |
| TEMP/RH% | 72/46 | 74/68 |
| FAIL D | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 |

# TABLE B-9. DATA SUMMARY, INDUCTORS (WE) (Q)

TYPE WE — INDUCTOR SUMMARY--% CHANGE — LIMIT 30.00 .W5

| JWE | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | 1.67 | .47 | .73 | | .47- | .75- | 1.26- | .34 | .69- | 1.33- | 1.56- | .91- |
| MEAN VAL | 2.23 | 2.27 | 2.24 | 2.25 | 2.23 | 2.22 | 2.21 | 2.20 | 2.24 | 2.22 | 2.20 | 2.20 | 2.21 |
| STD DEV | .09 | .07 | .10 | .11 | .09 | .08 | .15 | .12 | .04 | .12 | .10 | .09 | .08 |
| % VAR | 4.04 | 3.08 | 4.46 | 4.89 | 4.04 | 3.60 | 6.79 | 5.45 | 1.79 | 5.41 | 4.55 | 4.09 | 3.62 |
| TEMP/RH% | | 84/88 | 85/76 | 84/79 | 79/95 | 81/74 | 84/70 | 85/88 | 88/72 | 83/84 | 84/82 | 77/92 | 86/61 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JEWE | | 06/19/64 | 06/22/64 | 06/28/64 | 07/13/64 | 07/29/64 | 08/19/64 | 09/09/64 | 09/29/64 | 10/19/64 | 11/09/64 | 11/30/64 | 12/23/64 |
| AVE % CH | | 1.34 | 1.25 | 1.77 | .43- | .82- | .30 | 4.12- | 1.21- | 2.36- | .89- | 1.49- | 4.13- |
| MEAN VAL | 2.24 | 2.27 | 2.27 | 2.28 | 2.23 | 2.22 | 2.25 | 2.15 | 2.21 | 2.19 | 2.22 | 2.21 | 2.15 |
| STD DEV | .04 | .05 | .09 | .02 | .06 | .09 | .09 | .03 | .12 | .11 | .05 | .12 | .05 |
| % VAR | 1.79 | 2.20 | 3.96 | .88 | 2.69 | 4.05 | 4.00 | 1.40 | 5.43 | 5.02 | 2.25 | 5.43 | 2.33 |
| TEMP/RH% | | 82/76 | 83/80 | 84/79 | 79/98 | 80/78 | 85/80 | 82/80 | 87/73 | 84/72 | 85/79 | 76/98 | 89/60 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SWE | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | 1.77 | 1.03 | 1.15 | .87- | .37- | 1.14- | 3.36- | .51- | .14 | .29- | 9.65- | 4.89- |
| MEAN VAL | 2.24 | 2.28 | 2.26 | 2.26 | 2.22 | 2.23 | 2.21 | 2.16 | 2.23 | 2.24 | 2.23 | 2.02 | 2.13 |
| STD DEV | .04 | .05 | .11 | .15 | .01 | .08 | .13 | .13 | .09 | .15 | .12 | .15 | .04 |
| % VAR | 1.79 | 2.19 | 4.87 | 6.64 | .45 | 3.59 | 5.88 | 6.02 | 4.04 | 6.70 | 5.38 | 7.43 | 1.88 |
| TEMP/RH% | | 78/84 | 87/66 | 83/86 | 85/72 | 85/62 | 84/75 | 88/77 | 87/68 | 80/80 | 83/88 | 84/79 | 86/70 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SEWE | | 06/20/64 | 06/23/64 | 06/29/64 | 07/14/64 | 07/30/64 | 08/20/64 | 09/11/64 | 09/30/64 | 10/20/64 | 11/10/64 | 12/01/64 | 12/24/64 |
| AVE % CH | | 4.73- | .28- | .79 | 1.25- | 1.34- | 4.17- | 3.17- | .43- | 11.85- | 3.73- | 4.93- | 3.66- |
| MEAN VAL | 2.25 | 2.14 | 2.24 | 2.26 | 2.22 | 2.21 | 2.15 | 2.17 | 2.24 | 1.98 | 2.16 | 2.13 | 2.16 |
| STD DEV | .14 | .05 | .04 | .13 | .11 | .16 | .10 | .15 | .13 | .03 | .11 | .14 | .17 |
| % VAR | 6.22 | 2.34 | 1.79 | 5.75 | 4.95 | 7.24 | 4.65 | 6.91 | 5.80 | 1.52 | 5.09 | 6.57 | 7.87 |
| TEMP/RH% | | 79/86 | 86/72 | 82/80 | 85/70 | 85/58 | 82/82 | 89/74 | 86/76 | 78/84 | 83/86 | 82/80 | 84/74 |
| FAIL D | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CWE | | 08/20/64 | 09/09/64 | 09/29/64 | 10/26/64 | 11/24/64 | 12/16/64 | 01/07/65 | 01/22/65 | 02/20/65 | 03/18/65 | 04/10/65 | 06/21/65 |
| AVE % CH | | .74- | 9.83- | 29.06- | 38.93- | 2.29 | 3.64 | 3.35 | 2.98 | 3.55 | 2.03 | 2.13 | 2.33 |
| MEAN VAL | 2.21 | 2.19 | 1.99 | 1.57 | 1.35 | 2.26 | 2.29 | 2.28 | 2.27 | 2.29 | 2.25 | 2.25 | 2.26 |
| STD DEV | .09 | .09 | .01 | .12 | .08 | .08 | .09 | .10 | .13 | .13 | .11 | .15 | .05 |
| % VAR | 4.07 | 4.11 | .50 | 7.64 | 5.93 | 3.54 | 3.93 | 4.39 | 5.73 | 5.68 | 4.89 | 6.67 | 2.21 |
| TEMP/RH% | | 78/56 | 78/60 | 83/56 | 78/40 | 80/27 | 74/24 | 78/30 | 78/38 | 74/21 | 79/30 | 78/34 | 73/62 |
| FAIL D | | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | | 0/50 | 0/50 | 18/50 | 50/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-9. DATA SUMMARY, INDUCTORS (WE) (Q) (Cont.)

TYPE WE — INDUCTOR SUMMARY--% CHANGE — LIMIT 30.00 .W5

| JWE | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 1.67- | 6.95- | 3.63- | 3.16- | 3.71- | 4.55- | 11.31- | 1.88- | 2.02- | 5.90- | 1.90- | 5.28- |
| MEAN VAL | 2.19 | 2.08 | 2.15 | 2.16 | 2.15 | 2.13 | 1.98 | 2.19 | 2.19 | 2.10 | 2.19 | 2.11 |
| STD DEV | .14 | .17 | .07 | .09 | .06 | .06 | .26 | .05 | .12 | .04 | .04 | .12 |
| % VAR | 6.39 | 8.17 | 3.26 | 4.17 | 2.79 | 2.82 | 13.13 | 2.28 | 5.48 | 1.90 | 1.83 | 5.69 |
| TEMP/RH% | 84/69 | 81/76 | 85/58 | 84/70 | 84/76 | 87/64 | 81/90 | 84/85 | 88/65 | 82/78 | 79/96 | 82/82 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JEWE | 01/11/65 | 02/02/65 | 02/23/65 | 03/18/65 | 04/08/65 | 04/27/65 | 06/09/65 | 07/01/65 | 07/22/65 | 08/12/65 | 08/31/65 | 10/04/65 |
| AVE % CH | 1.39- | 10.49- | 9.34- | 2.79- | 2.65- | 5.98- | 5.68- | 1.03- | 3.16- | 4.38- | 1.82- | 2.44- |
| MEAN VAL | 2.21 | 2.01 | 2.03 | 2.18 | 2.18 | 2.11 | 2.11 | 2.22 | 2.17 | 2.14 | 2.20 | 2.19 |
| STD DEV | .06 | .07 | .10 | .08 | .08 | .13 | .13 | .11 | .04 | .11 | .03 | .14 |
| % VAR | 2.71 | 3.48 | 4.93 | 3.67 | 3.67 | 6.16 | 6.16 | 4.95 | 1.84 | 5.14 | 1.36 | 6.39 |
| TEMP/RH% | 84/60 | 83/68 | 84/62 | 82/78 | 82/84 | 86/64 | 82/78 | 84/92 | 87/66 | 82/78 | 79/96 | 83/80 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SWE | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | .88- | 6.84- | .32- | 8.67- | 7.75- | 2.95- | 11.88- | 3.79- | 1.38- | 5.70- | 2.88- | 4.66- |
| MEAN VAL | 2.22 | 2.09 | 2.23 | 2.05 | 2.07 | 2.17 | 1.97 | 2.15 | 2.21 | 2.11 | 2.17 | 2.13 |
| STD DEV | .03 | .10 | .11 | .10 | .10 | .12 | .16 | .15 | .03 | .11 | .15 | .16 |
| % VAR | 1.35 | 4.78 | 4.93 | 4.88 | 4.83 | 5.53 | 8.12 | 6.98 | 1.36 | 5.21 | 6.91 | 7.51 |
| TEMP/RH% | 76/00 | 86/66 | 84/62 | 84/76 | 86/64 | 87/64 | 88/72 | 90/74 | 72/96 | 85/68 | 87/60 | 80/94 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SEWE | 01/12/65 | 02/03/65 | 02/24/65 | 03/19/65 | 04/09/65 | 04/29/65 | 06/10/65 | 07/06/65 | 07/23/65 | 08/13/65 | 09/01/65 | 10/05/65 |
| AVE % CH | 2.08- | 6.44- | 7.12- | 4.04- | 9.85- | 6.48- | 8.17- | 6.56- | 3.98- | 2.72- | 4.19- | 5.07- |
| MEAN VAL | 2.20 | 2.10 | 2.09 | 2.15 | 2.02 | 2.10 | 2.06 | 2.10 | 2.16 | 2.18 | 2.15 | 2.13 |
| STD DEV | .08 | .26 | .12 | .15 | .23 | .04 | .11 | .06 | .12 | .13 | .09 | .09 |
| % VAR | 3.64 | 12.38 | 5.74 | 6.98 | 11.39 | 1.90 | 5.34 | 2.86 | 5.56 | 5.96 | 4.19 | 4.23 |
| TEMP/RH% | 78/83 | 82/70 | 82/66 | 85/80 | 84/67 | 88/60 | 88/70 | 88/74 | 72/96 | 85/70 | 88/60 | 80/94 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 1/25 | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| CWE | 07/15/65 | 08/16/65 | 09/08/65 | 09/17/65 | 10/07/65 | 10/27/65 | 11/11/65 | 12/07/65 | 12/28/65 | 01/19/66 | 02/04/66 | 02/24/66 |
| AVE % CH | 3.17 | 3.80 | 1.88 | 3.40 | 4.42 | 3.87 | 1.44 | 3.74 | 2.52 | 4.03 | 6.40 | 3.06 |
| MEAN VAL | 2.28 | 2.29 | 2.25 | 2.28 | 2.30 | 2.29 | 2.24 | 2.29 | 2.26 | 2.30 | 2.35 | 2.27 |
| STD DEV | .10 | .09 | .07 | .11 | .16 | .12 | .02 | .05 | .12 | .12 | .06 | .16 |
| % VAR | 4.39 | 3.93 | 3.11 | 4.82 | 6.96 | 5.24 | .89 | 2.18 | 5.31 | 5.22 | 2.55 | 7.05 |
| TEMP/RH% | 74/57 | 71/66 | 72/62 | 72/71 | 75/45 | 72/36 | 82/34 | 79/22 | 80/22 | 73/22 | 78/47 | 72/58 |
| FAIL D | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |
| FAIL C | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 | 0/50 |

## TABLE B-9. DATA SUMMARY, INDUCTORS (WE) (Q) (Cont.)

INDUCTOR SUMMARY--% CHANGE

LIMIT 30.00
OF LIM .W5

| TYPE WE JWE | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 2.88- | .39 | 1.29- | 1.52- | 2.54- | 1.36- | 1.22- | 2.15- | 3.86- | .28- |
| MEAN VAL | 2.17 | 2.24 | 2.20 | 2.20 | 2.17 | 2.20 | 2.20 | 2.18 | 2.15 | 2.22 |
| STD DEV | .12 | .05 | .11 | .10 | .14 | .08 | .14 | .13 | .13 | .15 |
| % VAR | 5.53 | 2.23 | 5.00 | 4.55 | 6.45 | 3.64 | 6.36 | 5.96 | 6.05 | 6.76 |
| TEMP/RH% | 78/92 | 80/80 | 84/72 | 84/76 | 88/54 | 87/56 | 84/67 | 90/57 | 83/67 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| JEWE | 10/27/65 | 11/17/65 | 12/08/65 | 01/20/66 | 02/08/66 | 03/02/66 | 03/23/66 | 04/14/66 | 05/04/66 | 05/26/66 |
| AVE % CH | 2.45- | 1.20 | .66- | 2.95- | 1.97- | 1.47- | 2.93- | 3.81- | 4.62- | .87 |
| MEAN VAL | 2.18 | 2.27 | 2.23 | 2.17 | 2.20 | 2.21 | 2.17 | 2.15 | 2.14 | 2.26 |
| STD DEV | .15 | .11 | .14 | .14 | .12 | .10 | .15 | .14 | .12 | .04 |
| % VAR | 6.88 | 4.85 | 6.28 | 6.45 | 5.45 | 4.52 | 6.91 | 6.51 | 5.61 | 1.77 |
| TEMP/RH% | 78/96 | 79/80 | 84/74 | 84/78 | 88/54 | 86/60 | 84/66 | 90/58 | 83/68 | 72/46 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| SWE | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | 5.68- | .76- | 6.15- | 5.20- | 5.16- | 4.29- | 3.35- | 4.66- | 5.26- | 2.96- |
| MEAN VAL | 2.11 | 2.22 | 2.10 | 2.12 | 2.12 | 2.14 | 2.17 | 2.14 | 2.12 | 2.17 |
| STD DEV | .28 | .13 | .13 | .13 | .15 | .14 | .14 | .12 | .11 | .16 |
| % VAR | 13.27 | 5.86 | 6.19 | 6.13 | 7.08 | 6.54 | 6.45 | 5.61 | 5.19 | 7.37 |
| TEMP/RH% | 80/86 | 74/92 | 86/62 | 85/70 | 87/64 | 84/62 | 87/64 | 88/70 | 86/74 | 66/52 |
| FAIL D | 0/25 | 0/25 | 0/24 | 0/24 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 1/25 | 1/25 | 0/24 | 0/24 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 | 1/25 |
| SEWE | 10/28/65 | 11/18/65 | 12/09/65 | 01/21/66 | 02/11/66 | 03/07/66 | 03/28/66 | 04/20/66 | 05/09/66 | 05/27/66 |
| AVE % CH | 4.54- | 1.63- | 7.19- | 5.02- | 5.14- | 6.70- | 7.77- | 5.51- | 6.17- | 2.26- |
| MEAN VAL | 2.14 | 2.21 | 2.08 | 2.13 | 2.13 | 2.10 | 2.07 | 2.13 | 2.11 | 2.20 |
| STD DEV | .13 | .02 | .21 | .14 | .12 | .06 | .24 | .03 | .15 | .10 |
| % VAR | 6.07 | .90 | 10.10 | 6.57 | 5.63 | 2.86 | 11.59 | 1.41 | 7.11 | 4.55 |
| TEMP/RH% | 79/94 | 74/94 | 84/68 | 85/70 | 87/64 | 84/62 | 88/62 | 88/73 | 88/66 | 66/52 |
| FAIL D | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 | 0/25 |
| FAIL C | 0/25 | 0/25 | 1/25 | 0/25 | 0/25 | 0/25 | 1/25 | 1/25 | 1/25 | 0/25 |
| CWE | 03/29/66 | 05/27/66 | | | | | | | | |
| AVE % CH | 4.24 | 3.27 | | | | | | | | |
| MEAN VAL | 2.30 | 2.28 | | | | | | | | |
| STD DEV | .09 | .01 | | | | | | | | |
| % VAR | 3.91 | .44 | | | | | | | | |
| TEMP/RH% | 72/46 | 74/68 | | | | | | | | |
| FAIL D | 0/50 | 0/50 | | | | | | | | |
| FAIL C | 0/50 | 0/50 | | | | | | | | |

APPENDIX C

DATA SUMMARIES FOR PHASE I COMPONENTS DRYING CYCLE

## EXPLANATION OF TERMS

% CHANGE is $\frac{X_i - X_o}{X_o} \times 100$,

where $X_o$ = initial value, resistance, capacitance or Q

$X_i$ = value measured at data taking (internal)

LIMIT is the agreed tolerance limit based upon the component specifications and coefficients.

AVE % CH is the arithmetic average of the % CHANGE value for the sample lot, excluding catastrophic failures.

MEAN VAL is the MEAN or $\overline{X}$ value of the sample lot, excluding catastrophic failures.

STD DEV is $\sqrt{\sum \frac{f_i (X_i)^2}{N} - (\overline{X})^2}$

Standard deviation $\sigma$, units of measure the same as for the component.

% VAR is the PERCENT VARIANCE $\frac{\sigma}{\overline{X}} \times 100$

TEMP/RH % is temperature (°F) and relative humidity (%) observed at the time the measurements were recorded.

FAIL D corresponds to the number of components in the lot whose value has exceeded the LIMIT but not exceeded twice its LIMIT with respect to the number of valid-data components.

FAIL C corresponds to the number of components in the lot whose value has exceeded TWICE the LIMIT with respect to the number of valid-data components.

TABLE C-1. DATA SUMMARY, DRYING CYCLE, COMPOSITION RESISTORS (RC)

| TYPE RC | LIMIT | 11.50 | RESISTOR | SUMMARY--% | CHANGE | | |
|---|---|---|---|---|---|---|---|
| JRC | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 5.53 | 5.07 | 4.75 | 4.23 | 3.15 | 2.14 |
| MEAN VAL | 10.045 | 10.600 | 10.554 | 10.522 | 10.470 | 10.362 | 10.260 |
| STD DEV | .117 | .169 | .191 | .169 | .184 | .146 | .180 |
| % VAR | 1.16 | 1.59 | 1.81 | 1.61 | 1.76 | 1.41 | 1.75 |
| TEMP/RH% | | 78/80 | 65/62 | 65/62 | 65/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JERC | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 5.42 | 4.96 | 4.71 | 4.21 | 3.17 | 2.13 |
| MEAN VAL | 10.042 | 10.586 | 10.540 | 10.515 | 10.465 | 10.360 | 10.255 |
| STD DEV | .109 | .144 | .141 | .081 | .138 | .151 | .138 |
| % VAR | 1.09 | 1.36 | 1.34 | .77 | 1.32 | 1.46 | 1.35 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SRC | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 4.81 | 5.09 | 4.22 | 3.81 | 2.87 | 1.67 |
| MEAN VAL | 10.019 | 10.501 | 10.528 | 10.442 | 10.401 | 10.307 | 10.186 |
| STD DEV | .134 | .146 | .158 | .118 | .115 | .114 | .158 |
| % VAR | 1.34 | 1.39 | 1.50 | 1.13 | 1.11 | 1.11 | 1.55 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SERC | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 10.73 | 4.21 | 4.98 | 3.71 | 2.73 | 1.92 |
| MEAN VAL | 10.000 | 11.067 | 10.421 | 10.497 | 10.371 | 10.273 | 10.192 |
| STD DEV | .047 | 1.153 | .038 | .165 | .047 | .047 | .060 |
| % VAR | .47 | 10.42 | .36 | 1.57 | .45 | .46 | .59 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 1/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-2. DATA SUMMARY, DRYING CYCLE, CARBON FILM RESISTORS (RN)

| TYPE RN | LIMIT | 2.00 | RESISTOR | SUMMARY--% CHANGE | | | |
|---|---|---|---|---|---|---|---|
| JRN | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .39 | .56 | .56 | .61 | .54 | .57 |
| MEAN VAL | 99.79 | 100.18 | 100.35 | 100.35 | 100.40 | 100.33 | 100.36 |
| STD DEV | .78 | .79 | .40 | .50 | .80 | .47 | .79 |
| % VAR | .78 | .79 | .40 | .50 | .80 | .47 | .79 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JERN | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .57 | .82 | .87 | .77 | .83 | .83 |
| MEAN VAL | 99.28 | 99.85 | 100.09 | 100.14 | 100.05 | 100.10 | 100.11 |
| STD DEV | .57 | .82 | .96 | .38 | .37 | .52 | .82 |
| % VAR | .57 | .82 | .96 | .38 | .37 | .52 | .82 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 55/70 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SRN | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .28 | .58 | .60 | .64 | .61 | .69 |
| MEAN VAL | 99.73 | 100.01 | 100.31 | 100.33 | 100.36 | 100.34 | 100.41 |
| STD DEV | .65 | .79 | .85 | .60 | 1.06 | .68 | 1.07 |
| % VAR | .65 | .79 | .85 | .60 | 1.06 | .68 | 1.07 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SERN | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .52 | .76 | .75 | .75 | .78 | .74 |
| MEAN VAL | 99.75 | 100.28 | 100.52 | 100.50 | 100.50 | 100.53 | 100.49 |
| STD DEV | .98 | .43 | .75 | .46 | .49 | .47 | .41 |
| % VAR | .98 | .43 | .75 | .46 | .49 | .47 | .41 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-3. DATA SUMMARY, DRYING CYCLE, WIREWOUND RESISTOR (RW)

TYPE RW LIMIT 5.25 RESISTOR SUMMARY--% CHANGE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| JRW | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .04- | .07- | .09- | .07- | .07- | .06- |
| MEAN VAL | 913.8 | 913.4 | 913.2 | 913.0 | 913.1 | 913.2 | 913.3 |
| STD DEV | 9.5 | 7.3 | 4.1 | 12.8 | 12.8 | 7.3 | 4.2 |
| % VAR | 1.04 | .80 | .45 | 1.40 | 1.40 | .80 | .46 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JERW | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .03- | .05- | .05- | .05- | .05- | .04- |
| MEAN VAL | 903.6 | 903.3 | 903.1 | 903.2 | 903.1 | 903.1 | 903.2 |
| STD DEV | 11.4 | 12.8 | 12.7 | 7.4 | 14.1 | 14.1 | 14.1 |
| % VAR | 1.26 | 1.42 | 1.41 | .82 | 1.56 | 1.56 | 1.56 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SRW | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .05 | .05- | .32- | .06- | .04- | .04- |
| MEAN VAL | 908.2 | 908.6 | 907.8 | 905.3 | 907.7 | 907.8 | 907.9 |
| STD DEV | 14.0 | 13.8 | 11.0 | 16.7 | 12.6 | 14.1 | 11.2 |
| % VAR | 1.54 | 1.52 | 1.21 | 1.84 | 1.39 | 1.55 | 1.23 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SERW | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .43 | .29 | .25 | .25 | .28 | .22 |
| MEAN VAL | 901.8 | 905.7 | 904.5 | 904.1 | 904.1 | 904.3 | 903.7 |
| STD DEV | 11.2 | 13.8 | 11.5 | 12.6 | 11.0 | 15.2 | 16.2 |
| % VAR | 1.24 | 1.52 | 1.27 | 1.39 | 1.22 | 1.68 | 1.79 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-4. DATA SUMMARY DRYING CYCLE, TANTALUM CAPACITORS ELECTROLYTIC (CS)

TYPE MC LIMIT 12.00 CAPACITOR SUMMARY--% CHANGE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| JMC | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 6.98- | 4.63- | 4.69- | 4.42- | 4.38- | 5.24- |
| MEAN VAL | 10.40 | 9.68 | 9.92 | 9.91 | 9.94 | 9.95 | 9.86 |
| STD DEV | .32 | .23 | .37 | .47 | .42 | .25 | .24 |
| % VAR | 3.08 | 2.38 | 3.73 | 4.74 | 4.23 | 2.51 | 2.43 |
| TEMP/RH% | | 78/80 | 70/55 | 67/72 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JEMC | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 1.48- | .46 | .07 | .05 | .27 | .46- |
| MEAN VAL | 10.16 | 10.01 | 10.21 | 10.17 | 10.16 | 10.19 | 10.11 |
| STD DEV | .66 | .46 | .42 | .41 | .57 | .42 | .53 |
| % VAR | 6.50 | 4.60 | 4.11 | 4.03 | 5.61 | 4.12 | 5.24 |
| TEMP/RH% | | 78/80 | 70/55 | 72/57 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 1/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 1/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SMC | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 6.23- | 2.99- | 3.21- | 2.96- | 2.79- | 2.28- |
| MEAN VAL | 10.12 | 9.49 | 9.81 | 9.79 | 9.82 | 9.83 | 9.89 |
| STD DEV | .28 | .22 | .34 | .28 | .05 | .34 | .16 |
| % VAR | 2.77 | 2.32 | 3.47 | 2.86 | .51 | 3.46 | 1.62 |
| TEMP/RH% | | 78/80 | 70/55 | 72/57 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 1/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SEMC | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 3.38- | .41- | .60- | .51- | .11- | 1.05 |
| MEAN VAL | 9.88 | 9.55 | 9.85 | 9.83 | 9.84 | 9.88 | 9.99 |
| STD DEV | .48 | .55 | .48 | .52 | .49 | .49 | .63 |
| % VAR | 4.86 | 5.76 | 4.87 | 5.29 | 4.98 | 4.96 | 6.31 |
| TEMP/RH% | | 78/80 | 70/55 | 72/57 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-5. DATA SUMMARY, DRYING CYCLE, CERAMIC CAPACITOR (CK)

TYPE CK LIMIT 15.00 CAPACITOR SUMMARY--% CHANGE

| JCK | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
|---|---|---|---|---|---|---|---|
| AVE % CH | | 2.93- | 6.21 | 1.32- | 1.58- | .87- | 1.62- |
| MEAN VAL | 100.0 | 97.0 | 106.1 | 98.6 | 98.4 | 99.1 | 98.3 |
| STD DEV | 7.3 | 6.5 | 6.4 | 5.2 | 4.5 | 4.4 | 4.6 |
| % VAR | 7.30 | 6.70 | 6.03 | 5.27 | 4.57 | 4.44 | 4.68 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JECK | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 12.46 | 15.34 | 9.29 | 5.43 | 4.19 | .05 |
| MEAN VAL | 99.3 | 112.5 | 115.2 | 109.1 | 105.0 | 103.7 | 99.6 |
| STD DEV | 6.2 | 23.7 | 21.4 | 17.9 | 13.4 | 11.4 | 11.3 |
| % VAR | 6.24 | 21.07 | 18.58 | 16.41 | 12.76 | 10.99 | 11.35 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 2/05 | 1/05 | 1/05 | 0/05 |
| FAIL C | | 2/05 | 2/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SCK | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 1.16- | 5.10 | 1.23 | 2.73 | 3.52 | 1.13 |
| MEAN VAL | 97.8 | 96.6 | 102.7 | 98.9 | 100.4 | 101.2 | 98.8 |
| STD DEV | 5.1 | 6.1 | 4.8 | 5.1 | 4.1 | 4.6 | 5.0 |
| % VAR | 5.21 | 6.31 | 4.67 | 5.16 | 4.08 | 4.55 | 5.06 |
| TEMP/RH% | | 78/80 | 65/62 | 68/70 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SECK | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 1.88- | 6.60 | 1.30 | 3.81 | 5.00 | 2.01 |
| MEAN VAL | 102.0 | 100.1 | 108.7 | 103.2 | 105.9 | 107.1 | 104.1 |
| STD DEV | 6.3 | 5.1 | 5.5 | 2.4 | 5.3 | 5.2 | 4.6 |
| % VAR | 6.18 | 5.09 | 5.06 | 2.33 | 5.00 | 4.86 | 4.42 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-6. DATA SUMMARY, DRYING CYCLE, MYLAR CAPACITORS (CT)

| TYPE CT | LIMIT 6.00 | CAPACITOR SUMMARY--% CHANGE | | | | | |
|---|---|---|---|---|---|---|---|
| JCT | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 3.03 | 2.90 | 2.89 | 2.81 | 2.73 | 2.45 |
| MEAN VAL | 98.25 | 101.23 | 101.10 | 101.09 | 101.01 | 100.94 | 100.66 |
| STD DEV | 1.79 | 1.66 | 1.66 | 1.78 | 1.89 | 1.55 | 1.83 |
| % VAR | 1.82 | 1.64 | 1.64 | 1.76 | 1.87 | 1.54 | 1.82 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JECT | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 2.99 | 2.84 | 2.85 | 2.79 | 2.65 | 2.63 |
| MEAN VAL | 96.30 | 99.18 | 99.04 | 99.04 | 98.99 | 98.86 | 98.83 |
| STD DEV | 1.98 | 2.08 | 2.08 | 2.25 | 1.97 | 1.89 | 2.02 |
| % VAR | 2.06 | 2.10 | 2.10 | 2.27 | 1.99 | 1.91 | 2.04 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SCT | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 2.59 | 2.43 | 2.44 | 2.38 | 2.31 | 1.86 |
| MEAN VAL | 98.41 | 100.95 | 100.79 | 100.80 | 100.74 | 100.67 | 100.23 |
| STD DEV | 2.91 | 2.86 | 2.96 | 3.00 | 3.08 | 3.03 | 3.22 |
| % VAR | 2.96 | 2.83 | 2.94 | 2.98 | 3.06 | 3.01 | 3.21 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SECT | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 2.81 | 2.79 | 2.66 | 2.62 | 2.54 | 2.14 |
| MEAN VAL | 98.18 | 100.94 | 100.92 | 100.79 | 100.75 | 100.68 | 100.28 |
| STD DEV | 1.77 | 1.54 | 1.50 | 1.78 | 1.78 | 1.54 | 1.79 |
| % VAR | 1.80 | 1.53 | 1.49 | 1.77 | 1.77 | 1.53 | 1.79 |
| TEMP/RH% | | 78/80 | 65/62 | 68/60 | 67/62 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-7. SUMMARY, DRYING CYCLE, MICA CAPACITOR (CM)

TYPE CM LIMIT 1.50 CAPACITOR SUMMARY--% CHANGE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| JCM | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .93- | .51- | .90- | .89- | .71- | .98- |
| MEAN VAL | 2.114 | 2.094 | 2.103 | 2.095 | 2.095 | 2.099 | 2.093 |
| STD DEV | .003 | .049 | .040 | .027 | .038 | .024 | .047 |
| % VAR | .14 | 2.34 | 1.90 | 1.29 | 1.81 | 1.14 | 2.25 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 1/05 | 1/05 | 1/05 | 1/05 | 1/05 | 1/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JECM | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .08 | .38 | .14 | .13 | .28 | .11- |
| MEAN VAL | 2.114 | 2.115 | 2.122 | 2.117 | 2.116 | 2.120 | 2.111 |
| STD DEV | .028 | .042 | .028 | .028 | .042 | .040 | .042 |
| % VAR | 1.32 | 1.99 | 1.32 | 1.32 | 1.98 | 1.89 | 1.99 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SCM | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .73 | .84 | .55 | .56 | .55 | .11- |
| MEAN VAL | 2.109 | 2.124 | 2.126 | 2.120 | 2.120 | 2.120 | 2.106 |
| STD DEV | .041 | .034 | .048 | .047 | .055 | .043 | .042 |
| % VAR | 1.94 | 1.60 | 2.26 | 2.22 | 2.59 | 2.03 | 1.99 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 1/05 |
| FAIL C | | 1/05 | 1/05 | 1/05 | 1/05 | 1/05 | 0/05 |
| SECM | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .91- | .48- | .72- | .66- | .54- | .60- |
| MEAN VAL | 2.115 | 2.096 | 2.105 | 2.100 | 2.101 | 2.104 | 2.103 |
| STD DEV | .041 | .034 | .033 | .033 | .044 | .014 | .027 |
| % VAR | 1.94 | 1.62 | 1.57 | 1.57 | 2.09 | .67 | 1.28 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/77 | 70/55 | 70/55 |
| FAIL D | | 2/05 | 0/05 | 2/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-8. DATA SUMMARY, DRYING CYCLE, FERRITE INDUCTORS (WE), INDUCTANCE

| TYPE | WE | LIMIT | 10.00 | INDUCTOR | SUMMARY--% CHANGE | | |
|---|---|---|---|---|---|---|---|
| JWE | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .29- | .52- | .88- | .63 | .59 | .86- |
| MEAN VAL | 40.05 | 39.93 | 39.84 | 39.70 | 40.30 | 40.29 | 39.70 |
| STD DEV | .38 | .51 | .29 | .42 | .33 | .28 | .66 |
| % VAR | .95 | 1.28 | .73 | 1.06 | .82 | .69 | 1.66 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JEWE | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .34 | .85- | .63- | .51 | .39 | .02 |
| MEAN VAL | 40.20 | 40.33 | 39.85 | 39.94 | 40.40 | 40.35 | 40.20 |
| STD DEV | .20 | .67 | .47 | .58 | .35 | .43 | .50 |
| % VAR | .50 | 1.66 | 1.18 | 1.45 | .87 | 1.07 | 1.24 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SWE | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | .96- | .48- | .37 | .99 | 1.09 | .11- |
| MEAN VAL | 40.52 | 40.13 | 40.32 | 40.67 | 40.92 | 40.96 | 40.48 |
| STD DEV | .39 | .61 | .57 | .13 | .55 | .66 | .38 |
| % VAR | .96 | 1.52 | 1.41 | .32 | 1.34 | 1.61 | .94 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SEWE | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 1.02- | 18.65- | .55- | .33 | .12 | 1.24- |
| MEAN VAL | 40.65 | 40.24 | 33.04 | 40.43 | 40.79 | 40.70 | 40.15 |
| STD DEV | .85 | .42 | 14.40 | .57 | .38 | .51 | .31 |
| % VAR | 2.09 | 1.04 | 43.58 | 1.41 | .93 | 1.25 | .77 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 1/05 | 0/05 | 0/05 | 0/05 | 0/05 |

TABLE C-9. DATA SUMMARY, DRYING CYCLE, FERRITE INDUCTOR (WE) (Q)

TYPE WE LIMIT 30.00 INDUCTOR SUMMARY--% CHANGE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| JWE | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 3.44- | .11- | 2.33- | 1.46- | 2.35 | .25- |
| MEAN VAL | 2.21 | 2.13 | 2.21 | 2.16 | 2.18 | 2.26 | 2.20 |
| STD DEV | .08 | .10 | .12 | .12 | .11 | .05 | .10 |
| % VAR | 3.62 | 4.69 | 5.43 | 5.56 | 5.05 | 2.21 | 4.55 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| JEWE | | 05/04/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 3.89- | .17- | .80- | 2.83 | 2.74 | .85 |
| MEAN VAL | 2.20 | 2.12 | 2.20 | 2.19 | 2.27 | 2.26 | 2.22 |
| STD DEV | .14 | .08 | .05 | .13 | .13 | .14 | .10 |
| % VAR | 6.36 | 3.77 | 2.27 | 5.94 | 5.73 | 6.19 | 4.50 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SWE | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 4.99- | 7.89- | 7.36- | 4.82- | 1.25 | 3.13- |
| MEAN VAL | 2.24 | 2.13 | 2.06 | 2.07 | 2.13 | 2.27 | 2.17 |
| STD DEV | .08 | .12 | .03 | .11 | .10 | .12 | .03 |
| % VAR | 3.57 | 5.63 | 1.46 | 5.31 | 4.69 | 5.29 | 1.38 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| SEWE | | 05/09/66 | 05/10/66 | 05/11/66 | 05/13/66 | 05/16/66 | 05/26/66 |
| AVE % CH | | 7.34- | 20.34- | 3.41- | 1.94 | .97 | 1.69- |
| MEAN VAL | 2.27 | 2.11 | 1.81 | 2.20 | 2.32 | 2.30 | 2.24 |
| STD DEV | .14 | .12 | .90 | .12 | .09 | .13 | .11 |
| % VAR | 6.17 | 5.69 | 49.72 | 5.45 | 3.88 | 5.65 | 4.91 |
| TEMP/RH% | | 78/80 | 70/55 | 68/59 | 67/72 | 70/55 | 70/55 |
| FAIL D | | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 | 0/05 |
| FAIL C | | 0/05 | 1/05 | 0/05 | 0/05 | 0/05 | 0/05 |

# APPENDIX D

## DATA SUMMARIES FOR PHASE II COMPONENTS ACCELERATED STRESS TEST

## TWENTY CYCLES

## MIL-STD-202C, METHOD - 106B

EXPLANATION OF TERMS

% CHANGE is $\frac{X_i - X_o}{X_o} \times 100$,

where $X_o$ = initial value, resistance, capacitance, or Q.

$X_i$ = value measured at data taking interval

AVE % CH is the arithmetic average of the % CHANGE values for the sample lot, excluding catastrophic failures

MEAN VAL is the MEAN or $\bar{X}$ value of the sample lot excluding catastrophic failures

STD DEV is $\sqrt{\sum \frac{f_i (X_i)^2}{N} - (\bar{X})^2}$

Standard deviation $\sigma$, units of measure the same as for the component.

% VAR is the PERCENT VARIANCE $\frac{\sigma}{\bar{X}} \times 100$

TEMP/RH % is temperature (°F) and relative humidity (%) observed at the time the measurements were recorded.

## TABLE D-1. ACCELERATED LIFE TEST DATA SUMMARY, CARBON COMPOSITION RESISTORS (RO)

TYPE RO — RESISTOR SUMMARY--% CHANGE

| ARO | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .38 | .43 | .53 | .55 | .53 | .50 | .52 | .50 | .54 | .56 | .57 | .57 |
| MEAN VAL | 4.695 | 4.713 | 4.715 | 4.720 | 4.721 | 4.720 | 4.719 | 4.720 | 4.719 | 4.721 | 4.722 | 4.722 | 4.722 |
| STD DEV | .135 | .119 | .135 | .127 | .127 | .127 | .111 | .111 | .112 | .102 | .112 | .135 | .119 |
| % VAR | 2.88 | 2.52 | 2.86 | 2.69 | 2.69 | 2.69 | 2.35 | 2.35 | 2.37 | 2.16 | 2.37 | 2.86 | 2.52 |
| TEMP/RH% | | 82/92 | 82/92 | 83/88 | 83/88 | 82/92 | 82/92 | 82/96 | 83/88 | 82/88 | 82/88 | 81/88 | 81/88 |

| AERO | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 07/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .52 | .52 | .54 | .57 | .55 | .59 | .62 | .66 | .70 | .70 | .61 | .61 |
| MEAN VAL | 4.612 | 4.637 | 4.636 | 4.637 | 4.638 | 4.638 | 4.640 | 4.641 | 4.643 | 4.645 | 4.645 | 4.641 | 4.641 |
| STD DEV | .114 | .085 | .117 | .118 | .116 | .078 | .078 | .108 | .104 | .103 | .102 | .077 | .073 |
| % VAR | 2.47 | 1.83 | 2.52 | 2.54 | 2.50 | 1.68 | 1.68 | 2.33 | 2.24 | 2.22 | 2.20 | 1.66 | 1.57 |
| TEMP/RH% | | 80/87 | 82/91 | 82/88 | 82/88 | 81/92 | 82/92 | 80/91 | 81/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE RO — RESISTOR SUMMARY--% CHANGE

| ARO | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .59 | .52 | .54 | .46 | .54 | .56 | .52 | .54 | .51 |
| MEAN VAL | 4.723 | 4.720 | 4.721 | 4.717 | 4.721 | 4.721 | 4.720 | 4.721 | 4.719 |
| STD DEV | .120 | .120 | .120 | .128 | .102 | .133 | .112 | .103 | .127 |
| % VAR | 2.54 | 2.54 | 2.54 | 2.71 | 2.16 | 2.82 | 2.37 | 2.18 | 2.69 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 82/88 | 81/88 | 82/96 | 82/96 | 82/92 |

| AERO | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .62 | .59 | .54 | .48 | .60 | .61 | .61 | .59 | .54 |
| MEAN VAL | 4.641 | 4.640 | 4.637 | 4.635 | 4.640 | 4.641 | 4.640 | 4.640 | 4.637 |
| STD DEV | .084 | .076 | .095 | .071 | .096 | .070 | .115 | .072 | .092 |
| % VAR | 1.81 | 1.64 | 2.05 | 1.53 | 2.07 | 1.51 | 2.48 | 1.55 | 1.98 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/90 | 80/96 | 82/96 | 82/92 |

# TABLE D-2. ACCELERATED LIFE TEST, DATA SUMMARY TIN OXIDE FILM RESISTORS (RL)

TYPE RL

RESISTOR SUMMARY--% CHANGE

| TYPE RL | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARL | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .02 | .01 | .07 | .09 | .08- | .05- | .02- | .04 | .01- | .05 | .03 | .03 |
| MEAN VAL | 9.960 | 9.962 | 9.961 | 9.967 | 9.969 | 9.952 | 9.955 | 9.958 | 9.964 | 9.959 | 9.965 | 9.963 | 9.963 |
| STD DEV | .032 | .072 | .071 | .054 | .071 | .071 | .054 | .095 | .072 | .033 | .095 | .035 | .083 |
| % VAR | .32 | .72 | .71 | .54 | .71 | .71 | .54 | .95 | .72 | .33 | .95 | .35 | .83 |
| TEMP/RH% | | 82/92 | 82/92 | 83/88 | 83/88 | 82/92 | 82/92 | 82/96 | 83/88 | 82/88 | 82/88 | 81/88 | 81/88 |
| AERL | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .05 | .04 | .11 | .13 | .09 | .07 | .07 | .14 | .08 | .13 | .15 | .14 |
| MEAN VAL | 9.937 | 9.942 | 9.941 | 9.948 | 9.950 | 9.946 | 9.944 | 9.944 | 9.951 | 9.945 | 9.950 | 9.952 | 9.951 |
| STD DEV | .041 | .080 | .080 | .039 | .097 | .080 | .075 | .074 | .080 | .049 | .074 | .081 | .097 |
| % VAR | .41 | .80 | .80 | .39 | .97 | .80 | .75 | .74 | .80 | .49 | .74 | .81 | .97 |
| TEMP/RH% | | 80/87 | 82/90 | 82/88 | 82/88 | 81/97 | 82/92 | 80/91 | 81/90 | 82/88 | 81/90 | 81/88 | 81/88 |

RESISTOR SUMMARY--% CHANGE

| TYPE RL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ARL | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | .08 | .02 | | .01- | | .03 | .03 | .02 | .05- |
| MEAN VAL | 9.968 | 9.962 | 9.960 | 9.959 | 9.960 | 9.963 | 9.963 | 9.962 | 9.955 |
| STD DEV | .082 | .072 | .083 | .054 | .071 | .033 | .071 | .054 | .072 |
| % VAR | .82 | .72 | .83 | .54 | .71 | .33 | .71 | .54 | .72 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 82/88 | 81/88 | 82/96 | 82/96 | 82/92 |
| AERL | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | .14 | .09 | .04 | .07 | .13 | .15 | .11 | .12 | .13 |
| MEAN VAL | 9.951 | 9.946 | 9.941 | 9.944 | 9.950 | 9.952 | 9.948 | 9.949 | 9.950 |
| STD DEV | .050 | .098 | .075 | .097 | .080 | .074 | .038 | .081 | .082 |
| % VAR | .50 | .99 | .75 | .98 | .80 | .74 | .38 | .81 | .82 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/90 | 80/96 | 82/96 | 82/92 |

# TABLE D-3. ACCELERATED LIFE TEST DATA SUMMARY, METAL FILM RESISTORS (MF)

TYPE MF — RESISTOR SUMMARY--% CHANGE

| TYPE MF | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AMF | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .16- | .39- | .56- | .64- | .65- | .74- | .93- | .82- | .94- | .58- | .60- | .57- |
| MEAN VAL | 9.994 | 9.978 | 9.955 | 9.938 | 9.929 | 9.928 | 9.920 | 9.901 | 9.911 | 9.899 | 9.936 | 9.933 | 9.936 |
| STD DEV | .078 | .078 | .052 | .070 | .107 | .102 | .076 | .078 | .040 | .076 | .078 | .042 | .077 |
| % VAR | .78 | .78 | .52 | .70 | 1.08 | 1.03 | .77 | .79 | .40 | .77 | .79 | .42 | .77 |
| TEMP/RH% | | 82/92 | 82/92 | 83/88 | 83/88 | 82/92 | 82/92 | 82/96 | 83/88 | 82/88 | 82/88 | 81/88 | 81/88 |
| AEMF | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .44- | .61- | 1.02- | .95- | .99- | .95- | .75- | .59- | .04 | .23- | .23- | .14- |
| MEAN VAL | 10.009 | 9.965 | 9.948 | 9.908 | 9.914 | 9.910 | 9.914 | 9.934 | 9.950 | 10.013 | 9.986 | 9.986 | 9.995 |
| STD DEV | .034 | .082 | .094 | .083 | .083 | .095 | .072 | .048 | .085 | .084 | .030 | .072 | .055 |
| % VAR | .34 | .82 | .94 | .84 | .84 | .96 | .73 | .48 | .85 | .84 | .30 | .72 | .55 |
| TEMP/RH% | | 80/87 | 82/90 | 82/88 | 82/88 | 81/92 | 82/92 | 80/91 | 81/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE MF — RESISTOR SUMMARY--% CHANGE

| TYPE MF | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AMF | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | .64- | .81- | .59- | .77- | .25- | .39- | .69- | .70- | .62- |
| MEAN VAL | 9.930 | 9.912 | 9.935 | 9.916 | 9.969 | 9.955 | 9.925 | 9.923 | 9.931 |
| STD DEV | .045 | .075 | .076 | .074 | .048 | .047 | .076 | .046 | .045 |
| % VAR | .45 | .76 | .76 | .75 | .48 | .47 | .77 | .46 | .45 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 82/88 | 81/88 | 82/96 | 87/96 | 82/92 |
| AEMF | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | .22- | .21- | .24- | .33- | .11- | .07- | .23- | .18- | .15- |
| MEAN VAL | 9.987 | 9.988 | 9.985 | 9.976 | 9.998 | 10.002 | 9.986 | 9.991 | 9.994 |
| STD DEV | .071 | .070 | .094 | .033 | .028 | .085 | .094 | .029 | .030 |
| % VAR | .71 | .70 | .94 | .33 | .28 | .85 | .94 | .29 | .30 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/90 | 80/96 | 82/96 | 82/92 |

# TABLE D-4. ACCELERATED LIFE TEST DATA SUMMARY, VARIABLE RESISTORS (RJ)

TYPE RJ — RESISTOR SUMMARY--% CHANGE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARJ | | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 | 03/01/66 |
| AVE % CH | | .06- | .93- | .13 | .28 | .13- | .06 | | .35 | .17 | .38 | .42 | .47 |
| MEAN VAL | 526.4 | 526.1 | 521.4 | 527.1 | 527.9 | 525.7 | 526.7 | 526.4 | 528.3 | 527.3 | 528.5 | 528.7 | 528.9 |
| STD DEV | 26.1 | 25.1 | 22.8 | 25.3 | 25.2 | 25.6 | 25.9 | 25.1 | 25.4 | 26.2 | 25.2 | 24.8 | 26.6 |
| % VAR | 4.96 | 4.77 | 4.37 | 4.80 | 4.77 | 4.87 | 4.92 | 4.77 | 4.81 | 4.97 | 4.77 | 4.69 | 5.03 |
| TEMP/RH% | | 82/92 | 82/88 | 83/88 | 83/92 | 82/92 | 82/96 | 82/88 | 83/88 | 82/88 | 82/88 | 81/88 | 81/90 |
| AERJ | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .20 | .05 | .41 | 14.99- | 13.82- | 14.85- | 10.56- | .38 | .06- | 6.99- | 4.71- | .28 |
| MEAN VAL | 505.4 | 506.4 | 505.7 | 507.5 | 431.2 | 437.0 | 431.9 | 453.2 | 507.4 | 505.1 | 470.9 | 482.1 | 506.9 |
| STD DEV | 22.1 | 22.8 | 21.7 | 23.8 | 159.7 | 146.0 | 155.9 | 114.2 | 23.1 | 22.8 | 81.6 | 60.6 | 21.8 |
| % VAR | 4.37 | 4.50 | 4.29 | 4.69 | 37.04 | 33.41 | 36.10 | 25.20 | 4.55 | 4.51 | 17.33 | 12.57 | 4.30 |
| TEMP/RH% | | 80/87 | 82/90 | 82/88 | 82/88 | 81/92 | 82/92 | 80/91 | 81/90 | 82/88 | 81/88 | 81/88 | 81/88 |

TYPE RJ — RESISTOR SUMMARY--% CHANGE

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ARJ | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 | 03/09/66 |
| AVE % CH | .40 | .35 | .24 | .22 | .47 | .47 | .22 | .27 | .11 |
| MEAN VAL | 528.6 | 528.3 | 527.7 | 527.6 | 528.9 | 528.9 | 527.6 | 527.9 | 527.0 |
| STD DEV | 24.7 | 25.4 | 26.6 | 26.7 | 26.1 | 26.5 | 25.6 | 24.9 | 25.9 |
| % VAR | 4.67 | 4.81 | 5.04 | 5.06 | 4.93 | 5.01 | 4.85 | 4.72 | 4.91 |
| TEMP/RH% | 81/91 | 80/88 | 82/95 | 81/88 | 82/88 | 81/96 | 82/96 | 82/92 | |
| AERJ | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | .27 | .10 | .06 | .01 | .28 | .33 | .06 | .25 | .11 |
| MEAN VAL | 506.8 | 506.0 | 505.8 | 505.5 | 506.9 | 507.1 | 505.7 | 506.7 | 506.0 |
| STD DEV | 22.7 | 22.9 | 21.6 | 22.1 | 22.4 | 23.2 | 22.9 | 22.9 | 21.9 |
| % VAR | 4.48 | 4.53 | 4.27 | 4.37 | 4.42 | 4.58 | 4.53 | 4.52 | 4.33 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/90 | 80/96 | 82/96 | 82/92 |

TABLE D-5. ACCELERATED LIFE TEST DATA SUMMARY, SOLID TANTALUM ELECTROLYTIC CAPACITORS (TA)

TYPE TA — CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ATA | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .22 | .33 | .55 | .78 | .98 | 1.20 | 1.39 | 1.59 | 1.61 | 1.78 | 1.85 | 1.95 |
| MEAN VAL | 10.75 | 10.77 | 10.78 | 10.81 | 10.83 | 10.85 | 10.88 | 10.90 | 10.92 | 10.92 | 10.94 | 10.95 | 10.96 |
| STD DEV | .14 | .34 | .40 | .18 | .35 | .42 | .21 | .22 | .30 | .36 | .29 | .20 | .19 |
| % VAR | 1.30 | 3.16 | 3.71 | 1.67 | 3.23 | 3.87 | 1.93 | 2.02 | 2.75 | 3.30 | 2.65 | 1.83 | 1.73 |
| TEMP/RH% | | 82/92 | 82/92 | 82/90 | 82/90 | 82/92 | 82/92 | 82/92 | 81/88 | 82/88 | 81/88 | 81/88 | 81/88 |
| AETA | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .89 | 1.29 | 1.64 | 2.04 | 2.49 | 2.82 | 3.02 | 3.17 | 3.40 | 3.40 | 3.51 | 3.62 |
| MEAN VAL | 11.00 | 11.09 | 11.14 | 11.18 | 11.22 | 11.27 | 11.31 | 11.33 | 11.34 | 11.37 | 11.37 | 11.38 | 11.39 |
| STD DEV | .29 | .30 | .21 | .30 | .02 | .03 | .30 | .21 | .30 | .03 | .03 | .22 | .30 |
| % VAR | 2.64 | 2.71 | 1.89 | 2.68 | .18 | .27 | 2.65 | 1.85 | 2.65 | .26 | .26 | 1.93 | 2.63 |
| TEMP/RH% | | 80/87 | 82/91 | 82/86 | 82/88 | 81/92 | 82/92 | 82/97 | 80/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE TA — CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ATA | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | 2.15 | 2.02 | 1.97 | 2.08 | 2.25 | 2.25 | 2.07 | 2.31 | 2.35 |
| MEAN VAL | 10.98 | 10.96 | 10.96 | 10.97 | 10.99 | 10.99 | 10.97 | 10.99 | 11.00 |
| STD DEV | .28 | .45 | .27 | .34 | .27 | .26 | .25 | .44 | .24 |
| % VAR | 2.55 | 4.11 | 2.46 | 3.10 | 2.46 | 2.37 | 2.28 | 4.00 | 2.18 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/89 | 81/96 | 82/96 | 82/92 |
| AETA | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | 3.70 | 3.73 | 3.68 | 3.77 | 3.84 | 3.77 | 3.89 | 3.73 | 3.91 |
| MEAN VAL | 11.40 | 11.41 | 11.40 | 11.41 | 11.42 | 11.41 | 11.42 | 11.41 | 11.43 |
| STD DEV | .22 | .30 | .03 | .04 | .21 | .04 | .31 | .30 | .30 |
| % VAR | 1.93 | 2.63 | .26 | .35 | 1.84 | .35 | 2.71 | 2.63 | 2.62 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 81/92 | 81/90 | 80/96 | 82/96 | 82/92 |

## TABLE D-6. ACCELERATED LIFE TEST DATA SUMMARY, LIQUID TANTALUM ELECTROLYTIC CAPACITORS (CL)

TYPE CL — CAPACITOR SUMMARY--% CHANGE

| ACL | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .39 | .41 | .32 | .37 | .79 | .33 | .34 | .41 | .26 | .33 | .29 | .34 |
| MEAN VAL | 4.695 | 4.714 | 4.715 | 4.711 | 4.713 | 4.730 | 4.711 | 4.712 | 4.715 | 4.708 | 4.711 | 4.709 | 4.711 |
| STD DEV | .934 | .938 | .935 | .934 | .935 | .928 | .936 | .934 | .936 | .934 | .935 | .935 | .937 |
| % VAR | 19.89 | 19.90 | 19.83 | 19.83 | 19.84 | 19.62 | 19.87 | 19.82 | 19.85 | 19.84 | 19.85 | 19.86 | 19.89 |
| TEMP/RH% | | 82/92 | 82/92 | 82/90 | 82/90 | 82/92 | 82/92 | 82/92 | 81/88 | 82/88 | 81/88 | 81/88 | 81/88 |

| AECL | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .76 | .88 | .75 | .78 | .92 | .98 | 1.00 | 1.08 | 1.05 | 1.01 | 1.05 | 1.09 |
| MEAN VAL | 4.811 | 4.847 | 4.853 | 4.846 | 4.848 | 4.855 | 4.857 | 4.858 | 4.862 | 4.861 | 4.859 | 4.861 | 4.862 |
| STD DEV | .581 | .591 | .588 | .592 | .591 | .588 | .593 | .593 | .591 | .587 | .587 | .586 | .589 |
| % VAR | 12.08 | 12.19 | 12.12 | 12.22 | 12.19 | 12.11 | 12.21 | 12.21 | 12.16 | 12.08 | 12.08 | 12.06 | 12.11 |
| TEMP/RH% | | 80/87 | 82/91 | 82/86 | 82/88 | 81/92 | 82/92 | 82/97 | 80/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE CL — CAPACITOR SUMMARY--% CHANGE

| ACL | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .34 | .20 | .63 | .17 | .44 | .31 | .16 | .24 | .29 |
| MEAN VAL | 4.711 | 4.705 | 4.723 | 4.703 | 4.716 | 4.710 | 4.702 | 4.707 | 4.709 |
| STD DEV | .936 | .932 | .921 | .934 | .937 | .936 | .930 | .931 | .933 |
| % VAR | 19.87 | 19.81 | 19.50 | 19.86 | 19.87 | 19.87 | 19.78 | 19.78 | 19.81 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/89 | 81/96 | 82/96 | 82/92 |

| AECL | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 1.15 | 1.05 | 1.02 | 1.03 | 1.26 | 1.21 | 1.14 | .95 | 1.14 |
| MEAN VAL | 4.865 | 4.860 | 4.859 | 4.859 | 4.870 | 4.867 | 4.864 | 4.855 | 4.864 |
| STD DEV | .584 | .587 | .581 | .588 | .582 | .584 | .580 | .576 | .577 |
| % VAR | 12.00 | 12.08 | 11.96 | 12.10 | 11.95 | 12.00 | 11.92 | 11.86 | 11.86 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 81/92 | 81/90 | 80/96 | 82/96 | 82/92 |

# TABLE D-7. ACCELERATED LIFE TEST DATA SUMMARY, CERAMIC CAPACITORS (KC)

TYPE KC — CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AKC | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | 1.36 | .89 | .59 | .08- | .73 | 1.14 | .77 | .26- | .46 | .18 | .26- | .37- |
| MEAN VAL | 9.903 | 10.037 | 9.990 | 9.960 | 9.894 | 9.974 | 10.013 | 9.977 | 9.877 | 9.947 | 9.920 | 9.876 | 9.865 |
| STD DEV | .429 | .422 | .401 | .384 | .378 | .395 | .358 | .389 | .384 | .387 | .405 | .369 | .381 |
| % VAR | 4.33 | 4.20 | 4.01 | 3.86 | 3.82 | 3.96 | 3.58 | 3.90 | 3.89 | 3.89 | 4.08 | 3.74 | 3.86 |
| TEMP/RH% | | 82/92 | 82/92 | 82/90 | 82/90 | 82/92 | 82/92 | 82/92 | 81/88 | 82/88 | 81/88 | 81/88 | 81/88 |
| AEKC | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | 1.24 | 2.10 | 1.62 | 1.36 | 2.41 | 2.32 | 2.22 | 1.53 | 2.17 | 1.50 | 1.41 | 1.23 |
| MEAN VAL | 10.399 | 10.528 | 10.616 | 10.567 | 10.540 | 10.649 | 10.639 | 10.629 | 10.557 | 10.624 | 10.554 | 10.545 | 10.526 |
| STD DEV | .320 | .354 | .307 | .331 | .341 | .315 | .341 | .338 | .332 | .323 | .334 | .322 | .330 |
| % VAR | 3.08 | 3.36 | 2.89 | 3.13 | 3.24 | 2.96 | 3.21 | 3.18 | 3.14 | 3.04 | 3.16 | 3.05 | 3.14 |
| TEMP/RH% | | 80/87 | 82/91 | 82/86 | 82/88 | 81/92 | 82/92 | 82/97 | 80/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE KC — CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AKC | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | .26 | .34 | .85 | .09 | .49- | .16- | .68 | .75 | .36 |
| MEAN VAL | 9.928 | 9.935 | 9.986 | 9.910 | 9.853 | 9.886 | 9.968 | 9.975 | 9.937 |
| STD DEV | .406 | .404 | .426 | .375 | .385 | .388 | .397 | .387 | .396 |
| % VAR | 4.09 | 4.07 | 4.27 | 3.78 | 3.91 | 3.92 | 3.98 | 3.88 | 3.99 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/89 | 80/96 | 82/96 | 82/92 |
| AEKC | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | 1.52 | 2.42 | 2.03 | 1.58 | 1.39 | 1.36 | 2.23 | 1.86 | 1.72 |
| MEAN VAL | 10.556 | 10.650 | 10.609 | 10.563 | 10.543 | 10.540 | 10.630 | 10.592 | 10.578 |
| STD DEV | .346 | .310 | .313 | .345 | .336 | .347 | .313 | .320 | .330 |
| % VAR | 3.28 | 2.91 | 2.95 | 3.27 | 3.19 | 3.29 | 2.94 | 3.02 | 3.12 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 81/97 | 81/90 | 80/96 | 82/96 | 82/92 |

## TABLE D-8. ACCELERATED LIFE TEST DATA SUMMARY, FIXED CERAMIC CAPACITORS (VK)

TYPE VK

CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVK | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | 2.14 | 2.07 | .38- | .47- | 2.11 | 1.05 | 2.19 | 2.64 | 3.08 | 1.48- | 3.20 | 3.26 |
| MEAN VAL | 341.9 | 349.1 | 348.9 | 340.6 | 340.3 | 349.0 | 345.4 | 349.3 | 350.9 | 352.4 | 336.8 | 352.8 | 353.0 |
| STD DEV | .6 | 6.2 | 4.4 | 9.7 | 8.5 | 7.1 | 4.7 | 8.5 | 5.6 | 8.0 | 8.8 | 4.9 | 6.7 |
| % VAR | .18 | 1.78 | 1.26 | 2.85 | 2.50 | 2.03 | 1.36 | 2.43 | 1.60 | 2.27 | 2.61 | 1.39 | 1.90 |
| TEMP/RH% | | 82/92 | 82/92 | 82/90 | 82/90 | 82/92 | 82/92 | 82/92 | 81/88 | 82/88 | 81/88 | 81/88 | 81/88 |
| AEVK | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | 3.79 | 4.34 | 4.35 | 3.65 | 3.50 | 4.34 | 5.30 | 3.93 | 4.89 | 4.09 | 4.83 | 5.20 |
| MEAN VAL | 330.7 | 343.2 | 345.0 | 345.0 | 342.7 | 342.2 | 345.0 | 348.2 | 343.6 | 346.8 | 344.2 | 346.6 | 347.9 |
| STD DEV | 2.8 | 2.6 | 5.9 | 2.9 | 5.9 | 5.2 | 5.8 | 2.5 | 6.5 | 5.3 | 3.8 | 5.3 | 3.6 |
| % VAR | .85 | .76 | 1.71 | .84 | 1.72 | 1.52 | 1.68 | .72 | 1.89 | 1.53 | 1.10 | 1.53 | 1.03 |
| TEMP/RH% | | 80/87 | 82/91 | 82/86 | 82/88 | 81/92 | 82/92 | 82/97 | 80/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE VK

CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AVK | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | 3.57 | 2.84 | 3.62 | 3.01 | 2.60 | 3.29 | 3.13 | 3.56 | 3.46 |
| MEAN VAL | 354.1 | 351.6 | 354.2 | 352.2 | 350.8 | 353.1 | 352.6 | 354.0 | 353.7 |
| STD DEV | 6.3 | 7.6 | 8.9 | 5.9 | 5.8 | 8.3 | 4.3 | 7.0 | 6.0 |
| % VAR | 1.78 | 2.16 | 2.51 | 1.68 | 1.65 | 2.35 | 1.22 | 1.98 | 1.70 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/89 | 81/96 | 82/96 | 82/92 |
| AEVK | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | 5.39 | 5.76 | 5.74 | 6.37 | 5.97 | 6.18 | 6.00 | 6.00 | 6.81 |
| MEAN VAL | 348.5 | 349.7 | 349.6 | 351.7 | 350.4 | 351.1 | 350.5 | 350.5 | 353.2 |
| STD DEV | .8 | 3.5 | 6.7 | 5.6 | 4.6 | 4.7 | 6.3 | 1.2 | 1.0 |
| % VAR | .23 | 1.00 | 1.92 | 1.59 | 1.31 | 1.34 | 1.80 | .34 | .28 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 81/97 | 81/90 | 80/96 | 82/96 | 82/92 |

# TABLE D-9. ACCELERATED LIFE TEST DATA SUMMARY, VARIABLE CAPACITORS (VC)

TYPE VC — CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVC | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | .59 | .59 | 1.84 | 1.72 | 1.76 | 1.46 | 1.39 | .75 | 1.73 | 7.15- | 1.52 | 2.05 |
| MEAN VAL | 157.6 | 158.6 | 158.6 | 160.5 | 160.4 | 160.4 | 159.9 | 159.8 | 158.8 | 160.4 | 146.4 | 160.0 | 160.9 |
| STD DEV | 5.1 | 3.5 | 1.1 | 5.9 | 3.6 | 3.7 | 5.3 | 4.9 | 6.0 | 4.1 | 4.0 | 5.9 | 4.4 |
| % VAR | 3.24 | 2.21 | .69 | 3.68 | 2.24 | 2.31 | 3.31 | 3.07 | 3.78 | 2.56 | 2.73 | 3.69 | 2.73 |
| TEMP/RH% | | 82/92 | 82/92 | 82/90 | 82/90 | 82/92 | 82/92 | 82/92 | 81/88 | 82/88 | 81/88 | 81/88 | 81/88 |
| AEVC | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
| AVE % CH | | 7.03 | 9.05 | 7.62 | 9.72 | 7.43 | 8.47 | 8.77 | 8.45 | 7.35 | 8.28 | 8.32 | 7.93 |
| MEAN VAL | 142.5 | 152.5 | 155.4 | 153.4 | 156.3 | 153.1 | 154.6 | 155.0 | 154.5 | 153.0 | 154.3 | 154.4 | 153.8 |
| STD DEV | 4.4 | 4.8 | 2.0 | 3.6 | 5.2 | 3.1 | 3.6 | 4.2 | 5.7 | 3.0 | 4.3 | 2.0 | 5.1 |
| % VAR | 3.09 | 3.15 | 1.29 | 2.35 | 3.33 | 2.02 | 2.33 | 2.71 | 3.69 | 1.96 | 2.79 | 1.30 | 3.32 |
| TEMP/RH% | | 80/87 | 82/91 | 82/86 | 82/88 | 81/92 | 82/92 | 82/97 | 80/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE VC — CAPACITOR SUMMARY--% CHANGE

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AVC | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | 2.74 | 1.31 | 1.42 | 1.93 | 1.00- | .84 | 1.16 | 1.18 | .04 |
| MEAN VAL | 162.0 | 159.7 | 159.9 | 160.7 | 156.1 | 159.0 | 159.5 | 159.5 | 157.7 |
| STD DEV | 3.2 | 4.5 | 3.1 | 3.6 | 2.4 | 4.5 | 1.9 | 4.2 | 3.9 |
| % VAR | 1.98 | 2.82 | 1.94 | 2.24 | 1.54 | 2.83 | 1.19 | 2.63 | 2.47 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 81/95 | 81/90 | 81/89 | 81/96 | 82/96 | 82/92 |
| AEVC | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
| AVE % CH | 8.67 | 8.55 | 9.25 | 10.29 | 8.88 | 9.99 | 7.53 | 8.01 | 9.85 |
| MEAN VAL | 154.9 | 154.7 | 155.7 | 157.2 | 155.1 | 156.7 | 153.2 | 153.9 | 156.5 |
| STD DEV | 4.4 | 3.8 | 4.5 | 2.8 | 5.3 | 5.8 | 5.9 | 5.1 | 6.0 |
| % VAR | 2.84 | 2.46 | 2.89 | 1.78 | 3.42 | 3.70 | 3.85 | 3.31 | 3.83 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 81/97 | 81/90 | 80/96 | 82/96 | 82/92 |

## TABLE D-10. ACCELERATED LIFE TEST DATA SUMMARY, VARIABLE INDUCTORS (VI) (INDUCTANCE)

TYPE VI — INDUCTOR SUMMARY--% CHANGE

| AVI | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .66- | .82- | .26- | .27- | .04- | .56- | .01- | 1.11 | .11 | .20- | .16- | .11- |
| MEAN VAL | 35.98 | 35.74 | 35.68 | 35.88 | 35.87 | 35.96 | 35.77 | 35.97 | 36.37 | 36.01 | 35.90 | 35.92 | 35.93 |
| STD DEV | .57 | .49 | .71 | .54 | .84 | .24 | .72 | .65 | .88 | .90 | .65 | .36 | .76 |
| % VAR | 1.58 | 1.37 | 1.99 | 1.51 | 2.34 | .67 | 2.01 | 1.81 | 2.42 | 2.50 | 1.81 | 1.00 | 2.12 |
| TEMP/RH% | | 82/92 | 82/92 | 82/90 | 82/90 | 82/92 | 82/92 | 82/92 | 82/88 | 82/88 | 81/88 | 81/81 | 81/88 |

| AEVI | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .01 | .93- | .72- | .95- | .73- | 1.05- | .77- | .47- | .38- | .81- | .80- | .72- |
| MEAN VAL | 36.71 | 36.71 | 36.37 | 36.45 | 36.36 | 36.45 | 36.33 | 36.43 | 36.54 | 36.57 | 36.41 | 36.42 | 36.45 |
| STD DEV | .74 | .85 | .76 | .32 | .85 | .39 | .59 | .66 | .64 | .74 | .85 | .53 | .53 |
| % VAR | 2.02 | 2.32 | 2.09 | .88 | 2.34 | 1.07 | 1.62 | 1.81 | 1.75 | 2.02 | 2.33 | 1.46 | 1.45 |
| TEMP/RH% | | 80/87 | 82/90 | 82/88 | 82/88 | 81/92 | 82/92 | 80/92 | 81/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE VI — INDUCTOR SUMMARY--% CHANGE

| AVI | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .09- | .22- | .40- | .04 | .64- | | 1.80 | .17- | .12- |
| MEAN VAL | 35.94 | 35.89 | 35.83 | 35.98 | 35.74 | 35.97 | 36.62 | 35.91 | 35.93 |
| STD DEV | .52 | .75 | .65 | .80 | .95 | .74 | .76 | .53 | .53 |
| % VAR | 1.45 | 2.09 | 1.81 | 2.22 | 2.66 | 2.06 | 2.08 | 1.48 | 1.48 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 82/88 | 82/88 | 81/88 | 81/96 | 82/96 | 82/92 |

| AEVI | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .90- | .57- | 1.97 | 1.37- | 1.08- | .84- | .71- | 1.96 | .91- |
| MEAN VAL | 36.38 | 36.50 | 37.44 | 36.21 | 36.31 | 36.40 | 36.45 | 37.43 | 36.38 |
| STD DEV | .84 | .74 | .31 | .52 | .84 | .66 | .65 | .53 | .54 |
| % VAR | 2.31 | 2.03 | .83 | 1.44 | 2.31 | 1.81 | 1.78 | 1.42 | 1.48 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 81/92 | 81/90 | 80/96 | 82/96 | 82/92 |

# TABLE D-11. ACCELERATED LIFE TEST DATA SUMMARY, VARIABLE INDUCTORS (VI) (Q)

TYPE VI — INDUCTOR SUMMARY--% CHANGE

| AVI | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | 1.35- | 1.55- | .96- | .96- | .77- | 1.35- | .96- | .96- | .58- | .96- | .96- | .96- |
| MEAN VAL | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.03 | 1.02 | 1.02 | 1.02 |
| STD DEV | .07 | .06 | .09 | .07 | .07 | .09 | .06 | .07 | .07 | .09 | .07 | .07 | .07 |
| % VAR | 6.80 | 5.88 | 8.82 | 6.86 | 6.86 | 8.82 | 5.88 | 6.86 | 6.86 | 8.74 | 6.86 | 6.86 | 6.86 |
| TEMP/RH% | | 82/92 | 82/92 | 82/90 | 82/90 | 82/92 | 82/92 | 82/92 | 82/88 | 82/88 | 81/88 | 81/81 | 81/88 |

| AEVI | | 02/17/66 | 02/18/66 | 02/19/66 | 02/20/66 | 02/21/66 | 02/22/66 | 02/23/66 | 02/24/66 | 02/25/66 | 02/26/66 | 02/27/66 | 02/28/66 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | | .38- | 1.35- | 1.16- | 1.35- | 1.16- | 1.54- | 1.35- | 1.16- | .96- | 1.35- | 1.35- | 1.35- |
| MEAN VAL | 1.04 | 1.03 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.02 | 1.03 | 1.02 | 1.02 | 1.02 |
| STD DEV | .09 | .07 | .07 | .09 | .07 | .09 | .03 | .07 | .09 | .09 | .07 | .07 | .07 |
| % VAR | 8.65 | 6.80 | 6.86 | 8.82 | 6.86 | 8.82 | 2.94 | 6.86 | 8.82 | 8.74 | 6.86 | 6.86 | 6.86 |
| TEMP/RH% | | 80/87 | 82/90 | 82/88 | 82/88 | 81/92 | 82/92 | 80/92 | 81/90 | 82/88 | 81/90 | 81/88 | 81/88 |

TYPE VI — INDUCTOR SUMMARY--% CHANGE

| AVI | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | .96- | .96- | 1.35- | .57- | 1.74- | .96- | .97 | .96- | .96- |
| MEAN VAL | 1.02 | 1.02 | 1.02 | 1.03 | 1.01 | 1.02 | 1.04 | 1.02 | 1.02 |
| STD DEV | .07 | .07 | .06 | .09 | .09 | .07 | .07 | .07 | .07 |
| % VAR | 6.86 | 6.86 | 5.88 | 8.74 | 8.91 | 6.86 | 6.73 | 6.86 | 6.86 |
| TEMP/RH% | 81/90 | 80/91 | 82/88 | 82/88 | 82/88 | 81/88 | 81/96 | 82/96 | 82/92 |

| AEVI | 03/01/66 | 03/02/66 | 03/03/66 | 03/04/66 | 03/05/66 | 03/06/66 | 03/07/66 | 03/08/66 | 03/09/66 |
|---|---|---|---|---|---|---|---|---|---|
| AVE % CH | 1.55- | 1.16- | 1.17 | 1.93- | 1.93- | 1.53- | 1.35- | 1.36 | 1.35- |
| MEAN VAL | 1.02 | 1.02 | 1.05 | 1.02 | 1.02 | 1.02 | 1.02 | 1.05 | 1.02 |
| STD DEV | .03 | .09 | .06 | .09 | .09 | .02 | .07 | .02 | .07 |
| % VAR | 2.94 | 8.82 | 5.71 | 8.82 | 8.82 | 1.96 | 6.86 | 1.90 | 6.86 |
| TEMP/RH% | 81/90 | 80/90 | 82/88 | 81/95 | 81/92 | 81/90 | 80/96 | 82/96 | 82/92 |

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Morrow, Walter B.

| 6. REPORT DATE | 7a. TOTAL NO. OF PAGES | 7b. NO. OF REFS |
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13. ABSTRACT

Selected electronic parts were subjected to the environments of a jungle and a shore site in the Panama Canal Zone, and to laboratory exposure tests based on modifications of MIL-STD-202C, Method 106B. Nondestructive failure analysis was performed on failed specimens. Phase I parts were exposed for 23 months to the outdoor Panama tropical environment. Phase I parts, when exposed to the laboratory tests, show a degree of correlation with the jungle site data in the degradation of critical values rather than by catastrophic failure. No correlation was found with the specimens exposed at the shore site. The laboratory test does not provide the stress and corrosive environment found at the shore exposure site. Tests showed that most parts recovered with time under drying conditions. Moisture absorption, surface wetting, dust contamination and corrosion are the predominant causes in the failure mechanisms thus far determined. Phase II parts have been exposed in the tropic environments for 9 months but no correlation of the data found with laboratory test information has been attempted, as yet. Modified laboratory tests utilizing salt fog will be tried in the next period.

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| Tropicalization | | | | | | |
| Environmental testing | | | | | | |
| Temperature humidity test | | | | | | |
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